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EDITED BY

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Original Communications.

NOTES ON "CLIMATIC" BUBO.

By F. H. A. Clayton, M.D., M.R.C.P.Edin.
Staff-Surgeon, R. N.

[Forwarded for publication by the Director-General, Medical Department, Admiralty.]

The etiology of this affection is still so much a matter of speculation that the following cases and differential blood counts may perhaps be worth recording, more especially in view of the evidence recently brought forward by Mr. Cantlie[1] in favour of his theory that it is allied to plague and is the true pestis minor. I do not remember any previous notes on the condition of the blood.

Case 1.—G. S., aged 26, stoker. Originally placed on sick list on June 14th, at Wei-hai-Wei, with a bubo in the right groin, for which no cause was apparent in the area of skin drained, nor in the penis, while no light was thrown on the case by his medical history. His temperature had not at first been taken, but on July 8th, three weeks later, was 99·4°, though there was no sign of suppuration. Gland at first tender, but on June 14th was smaller and less so, while on the 18th it again enlarged, without, however, any appearance of inflammation. July 11th, placed on arsenic, with almost immediate effect. On the 23rd the swelling was slowly subsiding, the glands having almost disappeared and only the swollen tissues around left, as if there were some lymphatic obstruction; and on the 26th he was sent to light duty. On August 25th he returned with a small burn of the hand. One gland still remained enlarged, but gave no trouble, and the surrounding swelling had to some extent passed off. He now, however, had a small patch of dhobie itch in the perineum, more especially on the left side, and, on questioning, said that he had had it at intervals since leaving England, and that one gland was palpable even then. This eruption was not even visible when the bubo arose. I first saw the case on July 8th, at which time there was no sign of eruption or other visible cause, and the glands, which were the horizontal set, were hard, matted, not tender, and showing no points of softening. There were no filariæ in his blood.

Blood.—He was very white-faced and anæmic-looking, but I had no means of measuring the hæmoglobin at the time. On August 7th no leucocytosis was present, and on August 27th the red cells numbered 4,125,700 and the white cells 9,000.

Differential Count.

Date.	Neutrophiles.	Eosinophiles.	Lymphocytes.	Large mononuclear.
	Per cent.	Per cent.	Per cent.	Per cent.
August 7th	44	22	29	5
,, 27th	46·4	18·7	27·7	7·2

In view of the eosinophilia his motions were examined for evidence of parasites, but none were present.

It is seen that in this case a quiescent focus of irritation was present, and that there was a change in the white cells, the eosinophiles being decidedly increased at the expense of the neutrophiles, while the mononuclear elements also showed slight relative increase. The next two cases are included for comparison as being indolent chronic buboes occurring without obvious cause, although neither patient was particularly anæmic, nor had they any febrile symptoms.

Case 2.—J. B., aged 31, 1st class, petty officer, was placed on sick list at Hong Kong on February 18th, with three enlarged glands in right groin, each the size of a hazel-nut, painless and not tender. No obvious active cause, but there was some brown pigmentation of skin over the inside of the thighs, latent dhobie itch, of which he gave a history of eight to ten years. He was given arsenic and a shot-bag applied, and by March 4th the glands were decidedly smaller and giving no trouble, and he went to duty. On April 2nd he returned again, however, when they were found to have suppurated in a leisurely, chronic sort of way, and the bubo was incised. Cover-glass preparations of the pus showed no organisms. On April 10th he returned to duty.

Blood Examination.

Date.	Red cells.	White cells.
February 23rd	4,920,000	29,600

Differential Count on February 23.

Neutrophiles.	Eosinophiles.	Lymphocytes.	Intermediate.	Large mononuclear.
Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
70·5	·7	21·5	2·4	4

3 myelocytes and 1 mast-cell seen; 561 cells counted.

In this case there also seemed to be a latent source of irritation.

Case 3.—W. J. aged 26, 1st class petty officer, was put on sick list on July 5th, at Wei-hai-Wei, with two horizontal glands enlarged in the right groin. There was a doubtful history of a strain which had apparently been the exciting cause of a similar enlargement lasting six days in 1898. The glands were at first tender but then became less so, and hard and brawny, and by the 13th had suppurated in an indolent way, and pus was evacuated. The bubo rapidly healed, and he went to duty on the 22nd.

Blood Examination.

Date	Red cells.	White cells.
July 11th	4,340,000	16,330.

Differential Count, July 13th. 697 counted.

Neutrophiles.	Eosinophiles.	Lymphocytes.	Intermediate.	Large mononuclear
Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
65	5	21	1	9

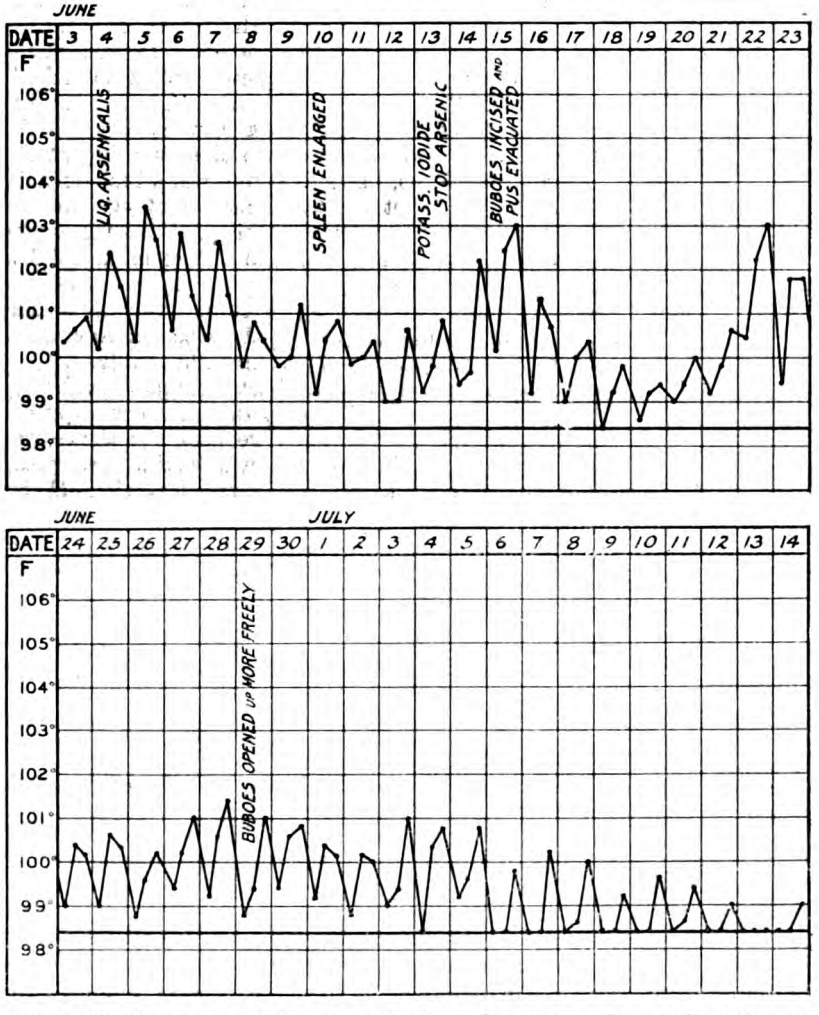
Case 4.—A. P. aged 29, stoker, came on the list at Hong Kong on June 3rd, when a good many cases of plague were occurring. He had the horizontal glands in both groins enlarged, those on the left side being decidedly tender, and those on the right hard. The only possible source of irritation was some indurated papules on the thighs, the remains of a severe attack of furunculosis the previous year. None of them, however, showed any signs of activity. His temperature was raised, but he was perfectly comfortable, his tongue was clean, his pulse quiet, and he looked well, and showed no very marked anæmia. His urine was strongly acid, but otherwise showed no abnormality. He was placed upon arsenic.

Several blood films were taken on the 3rd, 7th, and 12th, and stained for plague bacilli, in accordance with

Dr. Bell's adaptation of Ross's method for malaria, but no organisms were seen. Other films, however, taken at night on the 9th, on the possibility of the case being filarial in origin, and therefore with less precaution as to sterilisation of the skin, &c., showed no filariæ, but contained some cocci and epithelial cells, usually in relation. On the 10th the spleen was found to be decidedly enlarged, and the glandular swellings were increasing in size, and becoming more tender, though with no definite indication of suppuration. On the 6th, and again on the 11th, with the most rigid precautions as regards sterilisation, a hypodermic syringe was introduced into the substance of the left gland, a small quantity of thin whitish fluid drawn off and inoculated into broth on the first occasion, and on agar on the second. These were inoculated at about 37° C., but no growth resulted. A film was also made on the second occasion and stained, but no organisms could be seen. On the 15th both glands were freely incised, and a tube of agar inoculated from the pus, which was periglandular and ordinary in appearance, again with negative results. Temperature 103° that night. On the 17th he complained of severe neuralgic pain over the splenic region, which lasted for a day or two. A serum test was made with *M. melitensis* emulsion, in dilutions of 20 and 100, but without result, and on account of the eosinophilia his motions were searched, but no ova were present, although what was apparently the larva of some fly with fourteen rows of bristles and an alimentary tube was seen on one occasion.

Blood Examination.

Date	Number of red cells	Number of white cells	Hæmoglobin	Neutrophiles	Eosinophiles	Lymphocytes	Intermediate	Large mononuclear	Number counted
			Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
June 3rd..	—	—	—	53	19	20	2·8	4	348
,, 7th..	5,000,000	6,100	—	—	—	—	—	—	—
,, 10th..	—	—	—	54	16·8	19	1	4·5	327
,, 24th..	4,146,000	8,500	90	68·9	12·8	13	·3	4	274
August 1st	—	—	—	61	12·4	19	1·2	5·5	377
,, 29th	4,550,000	8,500	80	56·5	13·2	24·2	·6	4·9	529



Subsequent History.—By the end of June he had become very haggard and anæmic-looking, and had lost considerably in weight. The buboes required freer incision. During July they began to improve without, however, a corresponding alteration in bodily condition. By the beginning of August they had healed, and during this month he gained weight, and was sent to light duty on the 31st. He is now (October) quite well again.

In this case also, therefore, a previous cause for grandular irritation existed, and once again eosinophilia was marked.

What then is the cause of these buboes?

Venereal disease can be definitely excluded in all of them, and so can any active source of irritation in the area drained, although in no less than three there were the remains of what had been foci of irritation, at the time, however, quiescent.

I believe this to have had some part in determining the localisation of the adenitis, but by itself it was quite incapable of causing the condition. Nor does the course of the cases suggest a local infection as a cause; they do not of necessity suppurate, and when this does occur it is in an indolent manner and without pain or marked inflammation.

Mr. Cantlie for a long time has stated that he believes these to be really cases of pestis minor and allied to true plague, and has recently, in conjunction with Professor Hewlett,[1] described a case in which an organism was isolated from within the gland which apparently corresponds with one isolated by Kitasato in cases of plague, and also by Professors Simpson and Cobb in cases of bubo in Calcutta before true plague appeared.

In previously described cases of climatic bubo, how-

ever, the pus seems to have been sterile, and in Case 4, although I do not pretend that the bacteriological examination was anything but superficial, it would at least suggest that no readily cultivated organism was present. One would expect, too, that with the spleen enlarged, the organism would, like that of plague, be found in the blood by Bell's method, if the disease were a general one caused by an organism resembling that of plague, yet repeated examination showed no sign of it.

One of the most powerful arguments against the pestis minor theory is the fact, pointed out long ago by Inspector-General Godding,[3] that East Africa, and particularly Zanzibar, is the headquarters for these buboes, at all events, in the Navy. I can fully confirm the statement that they are met with frequently at Zanzibar from my own experience. Nevertheless no epidemic of true plague has followed them there as far as I know, unlike Calcutta and Hong Kong, and notwithstanding their constant occurrence. The rarity of true plague in the Navy, although "climatic bubo" is comparatively frequent, is perhaps an argument in a like direction.

I see that Mr. Cantlie is inclined to doubt the occurrence of true plague in Central Africa, as described by Koch and others, but I should have thought that the presence of an endemic focus in such close communication with Zanzibar and East Africa would rather favour his theory.

With regard to the blood, I have been unable to find any record of examination in pestis minor, but in true plague, Aoyama (Cabot)[4] appears to have found marked leucocytosis and also marked diminution of eosinophiles, or exactly the reverse of what was present in my two cases of "climatic bubo."

Although the percentage of eosinophiles varies without definite cause in health, there is in these two so marked and persistent an increase that it suggests a connection between the two conditions, and it is to be presumed that there is circulating in the body some toxin which acts chemotactically on these cells. Another case of chronic enlargement of cervical glands of undetermined nature and which had occurred previously when in a warm climate, also showed eosinophilia, though not quite so marked. A blood count is appended.

Blood Count.

Date	Number of red cells	Number of white cells	Hæmoglobin	Neutrophiles	Eosinophiles	Lympho-cytes	Inter-mediate	Large mononuclear	Mast	Number counted
			Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per c'nt.	Per c'nt.
Nov. 24	4,586,000	11,200	—	57	8	21	5	7·6	—	458
Dec. 12	4,800,000	18,200	—	51	13	20·7	7·6	7·2	—	512
Jan. 4	4,400,000	10,000	75	53	5·4	30	1·6	9·5	—	565
Feb. 15	5,060,000	45,000	90	50·8	11·9	31·8	1·3	2·9	·9	503

Horder[5] and others state that the eosinophiles are slightly increased in Europeans in the Tropics. This increase is very slight, and in a good many counts I cannot say that I have found much evidence of it, although I have found them increased in natives, probably from the presence of parasites. Nor do the records of blood counts made in other tropical countries that I have seen point in this direction either. I do not think, therefore, that it can be explained in this way. According to Professor Muir[6] the non-granular cells are those chiefly attracted in chronic or subacute conditions, and the eosinophiles by special chemotactic substances in relatively non-acute conditions, whereas in acute bacterial infections it is, *par excellence*, the finely granular cells which react. What is definitely known about eosinophiles bears this out, and in a large proportion of cases it results from some chemical substance circulating, such as that produced in helminthiasis. The condition of the blood in these two climatic buboes suggests, therefore, that if due to an organism it is one of comparatively mild degree of virulence, and that it is quite possibly produced by some circulating toxin, whether or not originally manufactured by bacteria. It is of interest to note that Dr. Gilman Moorhead,[7] while experimenting on rabbits, produced eosinophilia and glandular enlargement by the injection of a chemical substance in the shape of an alcoholic extract of leukæmic glands. The anæmia and debility which not infrequently precede by some time the formation of a "climatic bubo," and the pyrexia, which is not necessarily dependant on the formation of pus, would also suggest the possibility of this, and if such were the case, the localisation of the enlargement might readily be determined by some previous irritation or trauma. This would explain the common involvement of the inguinal glands, although there seems no reason why other glands should not at times be involved.

Finally, although positive bacteriological evidence is valuable, it is needless to say that isolation of even a definite organism does not prove that it is the cause of the condition. This is particularly the case with lymphatic glands, taking into consideration their function as filters, and it is obvious that enlarged and congested glands would afford unusually favourable opportunities for the development of organisms passing into them.

REFERENCES.

[1] Cantlie and Hewlett in report of Pathological Society of London, April 19th, 1904, in *British Medical Journal*. Cantlie in JOURNAL OF TROPICAL MEDICINE, August 15th, 1904.
[2] *Ibid.*
[3] *British Medical Journal*, September, 1896, and June, 1897.
[4] "Clinical Examination of the Blood."
[5] JOURNAL OF TROPICAL MEDICINE, September, 1901, and September, 1902.
[6] *British Medical Journal*, September 10th, 1904.
[7] *Ibid.*

Filariasis.

Röntgen Rays in Filariasis.—Drs. J. R. McDill and W. B. Wherry have treated patients suffering from *Filaria nocturna* in Manila by administering large doses of quinine, and then exposing the patient to X-rays, with the idea of killing the parent worm. So far the results have not been encouraging. Wherry claims to have seen a flagellum attached to the filarial embryo.

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THE

Journal of Tropical Medicine

JANUARY 2, 1905.

1905.

THE JOURNAL OF TROPICAL MEDICINE commences to-day the eighth volume. We have from time to time asked for the opinions and advice of our readers as to the management of the Journal, and we have been favoured by some valuable suggestions, upon which we have acted in almost every instance. We would again solicit our contributors and subscribers for advice, and we can assure them of a favourable hearing. It is hoped to increase the size of the Journal during the year, for our columns are all too limited to set forth fully the increased and increasing literature which appertains to tropical medicine. It is with some regret, however, that we contemplate increasing the size of the Journal. The busy practitioner has not time, nor has he, after a hard day's work in a tropical climate, the energy to wade through the voluminous pages and the heterogeneous mass of material contained in our large standard journals, which deal with general and often irrelevant matters.

The promise to keep the Journal as small as possible in our first issues was welcomed by many readers, partly on account of the time required to master the contents, and partly on account of the difficulty of conveying books of large size in journeying from one station to another, or from one continent to another. Most medical men are made regretfully conscious how often the wrapper of the larger medical journal remains intact, owing to various causes, but perhaps the most frequent cause is the size of the journal they are expected to get through. We can, we believe, pride ourselves in the belief that the JOURNAL OF TROPICAL MEDICINE is at least always looked at, and many subscribers have assured us that they find the Journal interesting from beginning to end. It is our endeavour to make it so, but perfection is a long way off, and we are quite conscious of numerous and radical shortcomings. The Journal is what those interested in the special department it deals with choose to make it, and although editors can guide and formulate a plan of issue, the importance of the Journal depends upon the value of the contributions. We look, therefore, to those who are interested in tropical medicine to take up the advancement of their Journal as a personal matter. We have had several imitators, each encroaching on the special sphere the Journal deals with, but we take these imitations as acknowledgements of our success, and of the necessity for our existence.

During the past year the "discovery-rate" in tropical medicine has been well maintained, and 1904 will be remembered as the period in which the importance of the Leishman-Donovan body has been prominently brought forward and recognised. Our knowledge of plague has been advanced perhaps more than any other of our better known diseases, by Dr. William Hunter, of Hong Kong. The observation of Dr. John Bell, of Hong Kong, that gastro-intestinal signs and symptoms precede not only the appearance of bubo but also those of fever in plague is an important one; and when to that is added Dr. Hunter's discovery of bacilli in the peripheral

blood in plague before the typical symptoms develop, we find it necessary to recast our ideas concerning plague, and to recognise it from the first onset as a septicæmic disease. Hitherto we have looked upon the general septicæmic state as a late development in the disease, and that the bubo in some indefinite way was an entity in the part it played; now we know that plague is primarily a septicæmic ailment, and that the bubo, the pneumonia, and the many and various lesions which occur in the course of the illness, are mere expressions of a pathological state due to a specific form of septicæmia.

The year 1905 is pregnant with many possibilities as regards tropical medicine. The creation of two lectureships, one in Protozoology, another in Helminthology, by the London School of Tropical Medicine, is a new and important feature, not only in the teaching of tropical medicine, but in the equipment of medical schools in Great Britain. The several scientific expeditions being sent out to Africa and to South America by the Liverpool School of Tropical Medicine leads us to hope that many obscure points in tropical pathology will be cleared up. Knowing the spirit that prevails in these, the two pioneer schools of tropical medicine of the world, we have every confidence that they will in the future, as in the past, succeed in maintaining the high position which this country has gained in the sphere of research in tropical pathology.

PLAGUE—RATS AND FLEAS.

Captain W. Glen Liston, I.M.S., in a paper read before the Natural History Society, Bombay, stated that the *Mus rattus* is the common rat of Bombay and the East generally, that it lives in the roof of houses and even in trees, and that it is from this rat, in all probability, that man becomes infected with plague. The *Mus decumanus*, the common rat of Europe, is a burrowing rodent living in drains and cellars, and man is not so liable to be infected thereby. Both species are liable to plague, but the habits of the former bring the animal more intimately in contact with man. The disappearance of plague in Europe was coincident with the invasion of that continent by the brown rat and the displacement of the black rat.

Fleas on biting man suck blood, and in their stomachs the plague bacilli finds blood in which they can live and thrive. The rat flea is seldom found on man; but on the sudden migration of rats in consequence of an unusual mortality amongst them, they leave their fleas behind them, and these fleas, from sheer hunger, attack man and other animals.

Translation.

THE DEVELOPMENT OF HERPETOMONAS, A FLAGELLATE RELATED TO THE TRYPANOSOMA.

(Preliminary Communication.)

By S. Prowazek (Rovigno).

[Reprinted from *Arbeiten aus den Kaiserlichen Gesundheitsamte*, Part III., Vol. xx.]

(*Translated from the German by P. Falcke.*)

A minute examination of the *Herpetomonas muscæ-domesticæ*, Burnett, in the house-fly, and of a new very nearly related species from *Sarcophaga*, Meg., the flesh-fly (sp. *S. hæmorrhoidalis*, Fall.), which I shall term *Herpetomonas sarcophagæ*, n. sp., led to the discovery that these forms are intimately related to the trypanosoma, and that they form the root of a complicated phylogenetic series, of which the trypanosoma are branches, though without relinquishing the primary important characteristics.

This fact coincides with the original historical development of the flies, inasmuch as these are to be traced from blood-sucking diptera, the parasites of which divide their cycle of development between the host and at least one intermediary host. According to the investigations of Fr. Brauer,[1] the orthorraphean nemocera, the gnats, culicidæ, psychodidæ, and in the older tertiary the brachycerous orthorrhaphæ, the leptidæ, tabanidæ and stratiomyidæ first appear mesozoically, and the eumyidæ (muscariæ) only appear later on.

In this sense the observation that the rat trypanosomes as well as the nagana parasites do not die off immediately in the intestinal tract of the house-fly, but continue to live for some time, and may even go on multiplying by longitudinal division, is exceedingly interesting, and is also suggestive of the possibility that various flies may incidentally become passive carriers of the blood trypanosomes.[2]

in order to comprehend the existence of herpetomonas,

Before considering the biology of the flagellata, and a description of the intestinal tract of the house-fly, which bears a certain resemblance to that of its relative, the tsetse-fly, is here given (fig. 1).

The fore-gut of the fly consists of the short pharynx and the long, muscular, chitinous œsophagus (*os*), into which, by means of a long narrow tract, the large sucking stomach (*vs*) provided with transverse anastomising muscles discharges. A part of the masses of food is retained in the sucking stomach; it is

[1] Fr. Brauer, "Ueber die Verbindungslieder zwischen den orthorrhaphen und cyclorrhaphen Dipteren, &c.," *Verhandl. der Zool.-Bot. Gesellschaft*, 1890, p. 273.

[2] As yet I have discovered no flagellate parasites in the stomoxys of Rovigno, which mostly had asses' blood in the intestinal canal.

mostly filled with a yellowish malodorous fluid, in which disc-shaped crystals and a few yeast fungus cells occur. The so-called proventricle (*pv*) is found at the point of transition of the œsophagus into the mid-gut. It is a sort of dilated annular fold, which Weissman was the first to describe as an intussusception of the fore-gut into the mid gut. Against it, somewhat like a wreath, run strong tracheal ramifica-

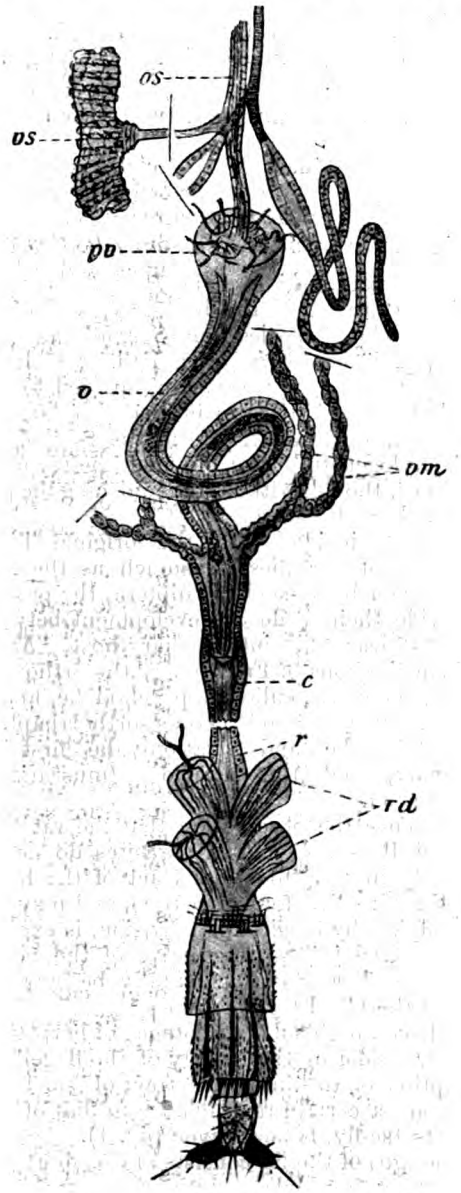

FIG. 1.

tions, which on its globular surface further divide into more (about twelve) branches. The mid-gut (*v*) is represented by a long spiral tube, which is somewhat more slender in the middle, and which is invested with high epithelial polygonal-rod border cells. By the abdominal cavity they are clothed with a thin bordering lamella or basal membrane, as well as with an internal and external layer of muscle. The intestinal epithelium is exposed to a periodical process of desquamation, whereby, according to Biedermann, digestive enzyma are set free. The cells to be desquamated are pressed forward, club-like, from the rest of the epithelium and become brown under the effects of autolytic processes. A similar discoloration sets in during the autumn, first in the nuclei of the salivary glands of flies that are dying off, and which subsequently attacks all the cells. The food does not come into direct contact with the intestinal cells, but is enclosed in a chitinous, liquid tubular membrane which commences at the proventricle, and is termed a funnel by A. Schneider. It is always partly extruded with the masses of fæcal matter, and is continually being regenerated. Morphologically, the limit of the mid-gut has not yet been firmly established; it is mostly taken as extending to the so-called Malpighian tubes, which are implanted as filamentous diverticuli of the proctodeum (*vm*).

The flies possess two very long Malpighian tubes on each side, originating from a moderately long contractile tract of the intestine. The large dilated cells of the tubes alternate with one another, being partly filled with yellowish concretions which resemble uric acid, partly with light-refracting granules with vacuoles. The small intestine is short, and near the colon (*c*) is shut off by a sort of annular fold. The epithelium here is very low, and within is very chitinous and grooved. The sphincter of the intestinal tract is formed by the rectum (*r*), which is considerably dilated, and which possesses four thimble-like rectal glands (*rd*), which, according to Weisman and Leydig, are not glands at all. Near by these there are strong bundles of trachea, which may be compared to certain tracheal gills that are occasionally found in a few larvæ of libellulæ, which likewise here serve as laminated organs for respiration. Judging from experiments with solution of litmus, it is found that the anterior part of the intestinal tract, especially the anterior part of the mid-gut, has an acid reaction. This action, which has been proved by means of a series of experiments under various conditions of food, coincides with the most recent reports of Biedermann.

Yeast fungus-like cells in variable quantities are found in the intestine of nearly all the flies; these cells are elongated or spindle-shaped, they resemble the fungi of the *apiculatus*, and have a cycle of development like the entomophtera. They have a cell nucleus and a metachromatic granule. Division ensues by means of asymmetrical budding. In the autumn, particularly, they sprout out to long tubes with several close-lying nuclei; they are club-like at the ends, where they carry a penicellular fan of ovoid cells. Azygospora, which presumably originated from auto-copulation, were also observed.

The observation that the house-flies carry on their legs *Tyroglyphus*, Megnin, *Chelifer cancroides*, Richters, and various acari and ants, is biologically interesting.

THE DEVELOPMENT OF HERPETOMONAS MUSCÆ-DOMESTICÆ (BURNETT).

This flagellate is 30 to 50 μ in length. The body, the best description of which has been furnished by Stein,[1] is somewhat lancet-like, and inclines to a

[1] F. R. v. Stein, "Der Organismus der Infusiontiere." Leipzig. Published by Engelmann, 1878; revised by L. Léger,

point at its posterior extremity, and in a few cases is slightly twisted. The cellular body is surrounded by a kind of delicate cuticle (periplast) which, when the creature is exposed to pressure, by means of which the entoplasm is squeezed out, remains revealed as a delicate sheath which stains red (Giemsa's method).

The protoplasm has a dense alveolar structure and contains micro-granules, and sometimes larger granulations, which may be stained a reddish-violet (after Giemsa). A vacuole is mostly distinguishable in the anterior part of the creature. This sometimes disappears, showing that it is undoubtedly engaged in slow pulsation. The flagellate possesses two nuclei (fig. 2,*a*), one that hypothetically seems connected with nutrition and which lies about the middle of the body, and a second close nucleus near the place

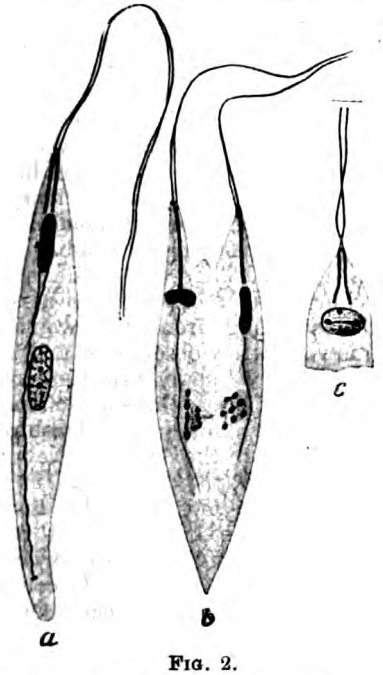

FIG. 2.

of origin of the flagellum, which, as in the trypanosoma, I shall term blepharoplast, and which probably plays a part in locomotion and the functions connected therewith. The first-named nucleus is mostly oval and carries a granular chromatic substance over an indistinct alveolar achromatic framework.

In most cases a somewhat irregular karyosoma or interior body is formed in the nucleus; sometimes, however, it dissolves entirely and becomes invisible. The second close blepharoplast, which stains dark, is either oval or kidney-shaped, rarely roundish; in a specimen suitably compressed, one is able to convince oneself that it also possesses a delicate nuclear structure, for centrally an interior body is thus revealed and at the periphery a thick chromatic coating is observable (fig. 2,*c*).

(*To be continued.*)

" Sur quelques cercomonadines nouvelles ou peu connues parasites &c.," *Archiv f. Protistenkunde*, 1903, vol. ii., No. 2, p. 181.

A RESEARCH INTO EPIDEMIC AND EPIZOOTIC PLAGUE.

By WILLIAM HUNTER, M.B. C.M., Aberd.

Government Bacteriologist, Hong Kong.

WHETHER regarded from a clinical, pathological, or bacteriological standpoint, we have had no more lucid, no more important contribution to the literature of plague since the disease was first investigated in Hong Kong in 1894. Dr. Hunter's report is published by the Government of Hong Kong in the form of a blue book, and extends to 107 pages, with numerous charts and tables.

In a preface by the principal civil medical officer, Dr. J. M. Atkinson, attention is called to the principal features of Dr. Hunter's researches, but it will be found that a careful perusal of the report will amply repay everyone interested in plague, and will induce even the most conservative amongst us to alter our opinion as to the true nature of plague.

The Symptom Complex of Plague.— Attention is drawn under this title to the tendency of medical practitioners to regard the fever and the bubo as the starting point of the illness and to neglect the exact mode of onset of the affection. Before the bubo appears, before even feverish symptoms develop, careful enquiry elicits the presence of vomiting and diarrhœa and sundry other evidences of constitutional upset in cases of plague.

The Gastro-intestinal Tract in Plague.—Hitherto affections of the stomach and intestine have been but little considered in the symptomatology of plague, but the observations of Dr. Bell, of the Government Civil Hospital, Hong Kong, has brought the fact to light that gastro-intestinal troubles frequently, if not almost always, precede the more commonly recognised symptoms of plague. Several cases are mentioned, and referred to in some detail in Dr. Hunter's report, which were admitted to hospital suffering from severe diarrhœa, from diarrhœa and vomiting, or from colic, and in whom fever subsequently developed, and a severe form of plague ran its course.

From these and other cases it is evident that diarrhœa and vomiting are among the early symptoms of plague. The patient at this stage may be going about his daily duties, and although some headache and a feeling of sleepiness may be present, there is no increase of temperature until later on. Primary gastro-intestinal symptoms point to the alimentary canal as the most likely channel by which the plague bacillus enters the human body, and a large part of Dr. Hunter's report is devoted to the proof of this idea. *Post-mortem* evidence goes to corroborate the fact that the plague virus causes marked lesions of the alimentary tract. The mucous membrane of the mouth, pharynx and œsophagus shows congestion, hyperæmia, œdema, and occasionally hæmorrhagic extravasations. The changes in the stomach consist chiefly of hyperæmia, petechiæ or hæmorrhages of considerable size, and minute ulcerations in all probability due to foci of hæmorrhages. The small intestine presents changes similar to those described in the stomach, but they are more pronounced. Peyer's patches and the solitary follicles become

swollen and are occasionally the seat of hæmorrhage; the intestinal walls are thickened and œdematous, and the peritoneal covering is hyperæmic and of a bright red or dark reddish-blue colour. The large intestine, from the cæcum to the rectum, shows similar lesions to those met with in the stomach and small intestine. The liver is increased in size and weight, the spleen pancreas and suprarenals are congested, and petechiæ, hyperæmia and hæmorrhagic extravasations may be present in each and all.

The evidence that the mucous membrane of the alimentary canal is the seat of primary changes in plague would seem to be conclusive, both clinical and *post-mortem* evidence bearing out the contention.

Plague a Septicæmic Disease ab initio.—There can be no doubt that the presence of a bubo in plague has thwarted our endeavour to arrive at a right understanding of the disease. The idea seems to prevail that throughout the disease the bacilli are pent up in the bubo, that the affection becomes septicæmic just before death, and that if recovery takes place it is because the bacilli never reach the blood. Dr. Bell has shown us that we must set aside this conception of plague once and for all, and he is amply confirmed by Dr. Hunter in his conclusions. Examining the blood of plague patients, after the manner suggested by Ross in malaria, Bell has shown that in the initial stages of plague the specific bacilli of the disease are present in the peripheral blood. The organisms are frequently present in the blood previous to the development of a bubo. With these facts before us, the conclusion seems justified that bubonic plague is in reality septicæmic plague in which the organism reaches the general circulation to begin with, multiplies there, producing the symptoms of the disease, and that the actual bubonic manifestation is an altogether secondary development.

The Bacillus present during Convalescence.—The presence of the bacillus more or less constantly in the blood in plague, from the earliest manifestation of the disease, throughout the illness, and to a late period in convalescence, still further suggests the septicæmic nature of the ailment. The continuance of the bacilli in the blood, and for an indefinite period after the acute attack is over, is a factor of prime importance in the pathology and epidemiology of plague. The power of infectivity of a person suffering from plague would seem thereby probable for an indefinite period, and suggests the possibility of a resting stage in man.

Varieties of Plague of Insignificant Importance.—From the above statements it will be readily understood that the usual divisions of plague into three typical types and into several minor sub-types are of quite secondary importance. Plague is a septicæmic disease, and the bubonic, pneumonic and septicæmic forms of the disease are due to idiosyncrasies of the individual or to the virulence of the infection. The disease is caused by the *Bacillus restis* in the blood-stream, where it can multiply, and the septicæmia may remain as such, or may be accompanied by bubonic swellings, or by secondary pneumonic changes. Hunter, however, is of opinion that there probably exists another type of the disease, namely, the *primary* pneumonic form caused by direct inhalation of a virulent bacillus. This inhalation disease is apparently something different from all other varieties.

Skin Eruptions in Plague.

Papules, vesicles, or pustules are frequently met with in plague, and the lesions may actually be of such a size as to resemble boils or carbuncles. The skin eruption usually appears first as small reddish or brown spots, accompanied by a burning sensation. The spot becomes indurated and congestive; a vesicle appears containing plague bacilli in numbers; the contents of the vesicle become invaded by ordinary cutaneous micro-organisms, and the contents become pustular. Hunter regards these skin eruptions as evidences of local growth of the *Bacillus pestis*, similar to that found in enteric fever where the typhoid rash is the result of focal multiplication of typhoid bacilli. These vesicles and pustules have nothing to do with the point of entry of the infection, and are further evidence of blood infection, and support the septicæmic nature of plague. That such eruptions may occasionally represent the point of inoculation of the plague virus, Hunter, however, does not deny, and cites a case as proof of such a contingency. Yet although at the point of entrance of the virus through the skin wound a vesicle forms which contains plague bacilli, it in no way differs from contemporaneous vesicles, which develops elsewhere in the body. The bubo which forms in this case is certainly a secondary development due to the general septicæmic condition and not the result of local lymphangitis leading from the wound to the gland. That the mode of infection through the skin is common is by no means likely. Lymphangitis extending from the wound to the nearest gland is very rarely observable, and this fact is made a special note of by many investigators; it has been regarded as a special phenomenon peculiar to plague. The explanation of the relationship between the local infection and the bubo, however, is not so simple as formerly supposed, for Dr. Hunter claims that the bubo is for the most part due to the blood infection set up by the bacillus, and not to the lymphatic tracts extending from the wound to the bubo. That infection by the skin is common, and that it obtains naturally is by no means obvious; it is usually impossible to find any evidence whatever of a point of inoculation through the skin. The bubo, moreover, is usually developed in and around the lymphatic glands which are not in direct connection with the area of skin through which the infection is supposed to have occurred. It is the deep and not the superficial glands which are usually affected in buboes, and more often than not it is the iliac lymphatic glands that are primarily and most seriously affected. The fact that lymphangitis is observable when accidental wounds of the skin occur during *post-mortem* examinations on plague cases, as in the case of Aoyama in 1894, recorded by Lawson, and in the case mentioned in the report by Hunter, is in favour of the belief that plague seldom reaches the body by way of skin wounds and infection, otherwise lymphangitis would be a much more common phenomenon in plague than it is. A *post-mortem* wound without the presence of plague bacilli in the infecting material induces lymphangitis; and although in the plague inoculations due to wounds made at a *post mortem* lymphangitis may follow, there is no evidence to show that the presence of the plague bacilli had anything to do with the lymphatic inflammation.

The Spread of Plague Infection by Insects.

Hunter writes that if an insect comes into contact with micro-organisms of an infectious nature, the latter may be deposited either on the surface of the body of the insect or gain the alimentary canal of the insect. He examined many insects to determine whether plague bacilli were present on the surface of the insects, with the following results:—

Flies.—A large number of flies were collected at the Public Mortuary and the Infectious Diseases Hospital, and at least 75 per cent. of the flies showed the presence of plague bacilli on their bodies. There was no apparent increase of death-rate amongst flies during the epidemics of plague, so that the *B. pestis* on the surfaces of their bodies did not affect their life.

The bacteriological examination of these insects was conducted in the following way. The flies on being caught were soaked in sterile normal saline or in bouillon. From this plate cultivations were made. The results were usually verified by animal experiment. Again, in other cases the flies were broken up in similar solutions and the routine methods proceeded with. The results obtained after washing the body surface of the fly were only occasionally positive. Those obtained from the crushed insect were highly satisfactory. One must remember that it is possible to obtain a negative result from the washings of the body surface, but a positive result from the contents of the alimentary canal and *vice versâ*.

It is probable these flies may convey plague on their backs, so to speak, for some considerable distance. Sugar, proved to be free of plague bacilli, introduced into sterilised test tubes containing plague-infected flies, was found to contain plague bacilli when tested experimentally. This experiment is of importance from the view of the possibility of the conveyance of plague by food contaminated by flies.

Mosquitoes.—Culex mosquitoes never showed plague bacilli on their bodies or limbs.

Pediculi also gave negative results.

Bugs were found to harbour plague bacilli on the surface of their bodies.

Cockroaches (*Blatta orientalis*) would appear to play an important *role* in plague-infected districts, and extreme danger exists when these insects can gain access to plague-infected places; and further, in all probability food-stuffs are frequently plague-infected by contact with cockroaches on or in which plague bacilli are present.

Plague Bacilli in the Intestines of Insects.

The evidence is very strong that infectious material may be widely disseminated in nature through the excrement of insects. Hunter found the *Bacillus pestis* in the alimentary canal and fæces of *flies*. These bacilli were found to be virulent and set up typical plague in artificially inoculated animals, *e.g.*, the rat. Similar positive results were also obtained with *bugs and spiders*, and a few *cockroaches*. These experiments show the possibility of food, cooking utensils, fruit, &c., becoming contaminated with plague bacilli and proving thereby infectious to man. The virulence of the virus infecting the insect requires further investigation. In the case of *flies*, however, plague bacilli would appear to pass through their intestines uninjured; but in the case of *bugs* and *fleas* the virulence of the bacilli would appear to be lowered during the passage.

The Mechanism of Infection.

(1) *Suctorial Insects.*

Mosquitoes appear to play no part in the transmission of plague by their bites.

Fleas.—The general results obtained by direct observation and experiment go to show that fleas play an unimportant *role* in the direct spread of plague. Professor Simpson, in 1902, obtained negative results when testing the power of fleas to procure the infection of healthy rats and monkeys by plague-infected rat fleas; the general experience of other observers also bears out this conclusion.

Bugs (*Cimex lectularis*) have been held responsible for the spread of plague by their bites, but the evidence is not of a convincing nature, and all statements of their positive influence in this respect must be received with caution.

Pediculi do not appear to play a part in the spread of plague.

(2) *Non-suctorial Insects.*

Flies and cockroaches, &c., may gather plague bacilli from human excretions, from the excretions of other animals, or from infected articles, and subsequently transport these germs, either in or upon their bodies, to any object on which they may alight.

The Infection of Food by Insects.

Hunter's observations go to prove that the infection of food by insects would appear to be a commoner mode of the spread of the disease than is generally believed. Food, such as rice, may be infected by cockroaches, and plague bacilli have actually been recovered from rice, and it is not impossible some connection may exist between the infection of rice and cockroaches. Food may also become infected through other agencies, namely, contact with plague-infected material of varied nature and the secretions and excretions of plague-infected men and animals. According to Hunter, the infection of food and household utensils would appear to be the most important *role* played by insects in the spread of plague.

Colonial Medical Reports.

British Guiana.

Report of Surgeon-General Joseph Edward Godfrey, M.B., C.M.Edin., for the Year 1903-1904.

Abstract.

The Report of the Medical Department from April 1st, 1903, to March 31st, 1904, was issued from the Surgeon-General's Office, Georgetown, Demerara, on September 6th, 1904.

Population of British Guiana, 300,748.

Health of the Colony.

A.—Death-rate.

The death-rate of the whole Colony was 28·9 per thousand, and the birth-rate 29·3 per thousand, the births exceeding the deaths by 14.

The death-rate for the city of Georgetown and its environs, exclusive of the country patients at the public hospital, was 44·1 per thousand.

The high death-rate of Georgetown points to the existence of some special cause or causes why the death-rate of the city should be so much greater than that of the Colony generally.

I attribute the causes to the following:—

(1) The insanitary condition and excessive overcrowding, chiefly amongst the lower and poorer class; this means deficient ventilation and light, and the unfortunates who have to breathe the vitiated atmosphere contract all sorts of diseases.

(2) Tuberculosis is accountable for 13·9 per cent. of the total deaths, and as the percentage of deaths from this disease for the whole Colony is only 8 per cent., it proves conclusively that the excess of this disease is largely due to overcrowding.

(3) Excessive infantile mortality; 22·8 per cent. of the total mortality was due to children under one year of age, and 29·1 per cent. to children under five years of age.

(4) Want of a proper way of disposal of sewage. The city is in parts saturated with sewage due to the existence of cesspits, which are always a standing danger to the inhabitants, and one of the factors tending to a high death-rate by inducing bowel complaints.

B.—Infantile Mortality.

The returns of the Registrar-General for the year 1903 reveal a most appalling mortality amongst infants. The mortality of children under one year of age to every thousand children born was for the whole Colony 205. There can only be one conclusion, and that is the infantile mortality for the whole Colony is excessive (in England it ranges from 130 to 140 for every thousand births), but for the city of Georgetown it is appalling.

The time has certainly arrived for active steps to be taken to reduce this terrible loss of infant life.

I am convinced that no progress can be made in reducing the mortality until we adopt some measures similar to those practised in Great Britain and other countries, and mothers and others having the charge of young infants realise that milk is the proper food, and not the so-called pap and other abominations on which the helpless babe is fed.

C.—Small-pox Epidemic.

I regret to say that during the year small-pox, fortunately of a comparatively mild type, prevailed throughout the Colony. The disease was introduced here from Trinidad.

In order to give every inhabitant of the Colony the chance of being vaccinated, every medical practitioner was appointed a public vaccinator. In the outlying districts, where the services of a medical man could not be obtained, competent persons were appointed.

In only a few isolated instances did the disease appear on the sugar estates, where the inhabitants were chiefly East Indian coolies. When it did it was always in unvaccinated persons, and did not spread. This was due fo the fact that the persons afflicted were properly isolated, and also that the coolies are well protected by vaccination.

Vaccination was made compulsory for all "contacts."

The Isolation Hospital was closed on March 31st, 1904, the last case having been discharged on February 27th, 1904.

There were in all 1,821 cases of small-pox reported, of which 1,434 were treated at the Isolation Hospital.

There were 14 deaths, which is equivalent to a death-rate of quite 7 per cent.

D.—Malarial Fever.

Malarial fever has been prevalent throughout the whole Colony. Now that it has been conclusively proved that malarial fever is caused by the presence in the blood of the malarial parasite known as the *Plasmodium malariæ*, and that this parasite is introduced by a species of mosquito called the *Anopheles*, every endeavour should be made to guard against this disease.

The methods that have been most successful up to the present are:—

(*a*) The taking of small doses of quinine.

(*b*) The filling-up or draining of stagnant pools of water in which the Anopheles breed.

(*c*) The prevention of inoculation by Anopheles by the use of mosquito nets.

If everyone would fill up, in the grounds round their residences, all places where stagnant water can accumulate we should considerably reduce the number of these mosquitos by abolishing their breeding grounds; vats should be enclosed with mosquito-proof wire netting. The larvæ are often to be found in vases and other ornaments used for flowers in the house. A few drops of kerosine oil would kill them.

E.—Ankylostomiasis.

The presence of this disease, due to an intestinal worm (the *Ankylostoma duodenale*), is now generally recognised. This disease has been and is still being introduced into the Colony by East Indian immigrants. That it is on the increase admits of no doubt.

It is hardly too much to say that this parasite causes more harm than all the other intestinal parasites put together, and it is a well-established fact that persons suffering from this disease are liable to be carried off by comparatively slight ailments, the whole system being so debilitated and undermined.

It is especially prevalent amongst the East Indian immigrants, and I am convinced the estates are yearly losing a considerable amount of labour by it.

Mode of Infection.—It is spread through the agency of dejecta of people suffering from this disease, the embryos finding their way into the human alimentary canal either by muddy water or in the mud or dirt adhering to the hands or food receptacles of the workmen. They may also be introduced through the skin, and in my opinion and that of several of the medical officers who have closely studied the subject, the disease known in this colony as "ground itch" is due to the irritation caused by the embryos working their way through the skin. Persons who work in contaminated fields and trenches are the principal sufferers from "ground itch."

It is therefore essential to prevent fæcal contamination of the soil and water by the depositing of fæces

about huts and fields. This can best be done by the establishment of latrines of a simple kind, and suited to native habits. I am convinced that we shall never make any marked progress in stamping out this disease until this is done.

F.—Tuberculosis.

This disease, according to the returns at my command, has been the cause of 8 per cent. of the total mortality of the Colony for the year, but there are strong grounds for believing that the mortality is higher than this. That pulmonary tuberculosis is on the increase, especially in the city, is beyond doubt. The mortality in Georgetown from this disease was 13·9 per cent.

G.—Diarrhœa and Dysentery.

These diseases were prevalent throughout the year, and accounted for 12 per cent. of the total mortality. They are largely due to insanitary surroundings, unwholesome food, and the want of good drinking water.

EXPENDITURE.

The publication of the expenditure of the Medical Department is interesting for medical officers in other Colonies for purposes of comparison. The medical staff consisted of 37 officers, distributed as follows: Administrative Officers, 2; Institution Officers, 11; Institution and District Officers, 3; District Medical Officers, 13; Subsidised District Medical Officers, 5; Relief Roster Officers, 2; Vacancy, 1.

The following table shows the total expenditure in dollars (American) of the Medical Department of the Colony for the year 1903-04:—

Salaries	Surgeon-General	$5,280 00
	Medical Inspector	4,319 99
	Medical Officers	109,770 80
	Special Medical Officers	6,360 00
	Staff-Surg.-Gen.'s Office	3,074 83
Travelling expenses, &c.	Surgeon-General	66 94
	Medical Inspector	635 08
	Medical Officers	9,867 23
Stationery and Messenger, Surgeon-General's Office		380 86
Hospitals		92,804 91
Asylums		73,043 13
*Epidemic of Small-pox, Isolation Hospital and Certificates		7,485 48
*Vaccination		35,456 13
†*Post-mortem* Fees		3,800 00
Allowances, Medical Superintendent, Leper Asylum (in lieu of private practice and personal)		700 00
Resident Surgeon, Public Hospital, Berbice (house allowance and in lieu of private practice and personal)		876 00
Dispensaries in Districts, including Moruca		2,695 09
Nurse-Midwives in Districts		82 42
Medicines for Poor in Rural Districts		374 45
		$364,076 34
Amounts paid into Treasury:—		
Hospitals and Asylums		$11,311 49
Dispensaries		437 82
Certificates, Nurse-Midwives		50 00
Lymph disposed of to Private Medical Practitioners		20 80
		$11,820 11
Nett Expenditure		$352,256 23.

* Extraordinary expenditure due to Small-pox epidemic.

† Charged to administration of Justice.

BRITISH GUIANA PUBLIC HOSPITALS.

DISEASES	CASES	DEATHS
General.		
Alcoholism	14	—
Anæmia	249	1
Beri-beri	1	—
Blackwater Fever	—	—
Chicken-pox	19	—
Cholera	—	—
Choleraic Diarrhœa	—	—
Diphtheria	4	3
Debility	162	29
Delirium Tremens	—	—
Dengue	—	—
Diabetes	6	1
Dysentery	513	137
Enteric Fever	—	—
Erysipelas	18	5
Febricula	19	—
Gonorrhœa	272	—
Influenza	219	2
Leprosy	82	4
Malarial Fever—		
(*a*) Intermittent	2,552	45
(*b*) Remittent	360	13
(*c*) Pernicious R.	41	31
Malarial Cachexia	76	3
Marasmus	37	33
Measles	—	—
Mumps	—	—
New Growths—		
Non-malignant	93	2
Malignant	105	27
Plague	—	—
Pyæmia	—	—
Rheumatism	578	—
Rheumatic Fever	—	—
Rheumatoid Arthritis	—	—
Scurvy	—	—
Scarlet Fever	66	61
Septicæmia	—	—
Sloughing Phagedæna	—	—
Small-pox	45	—
Syphilis—		
(*a*) Primary	21	4
(*b*) Secondary	335	10
(*c*) Tertiary	22	12
(*d*) Congenital	272	—
Tetanus	23	17
Tubercle	91	30
Whooping Cough	26	—
Yaws	20	—
Yellow Fever	—	—
Other Cases	212	—
	6,181	489
Local.		
Diseases of the—		
Cellular Tissue	677	
Circulatory System	172	51
Digestive System	1,713	187
Ear	20	—
Eye	282	—
Generative System—		
Male Organs	530	3
Female Organs	14,45	43
Lymphatic System	99	2
Urinary System	903	272
Nervous System	514	53
Organs of Locomotion	195	2
Respiratory System	1,903	493
Skin	989	6
Nose	11	6
Injuries, General, Local	701	14
Parasites	630	54
Poisons	17	—
	8,641	1,067

The preceding table represents the diseases and the number of cases treated at the following hospitals:—

Georgetown, beds 700; Berbice, beds 150; Suddie, beds 80; Bartica, beds 35; and Morawhanna including Arakaka Ward and Dispensary, beds 32. Total number of beds in the five hospitals, 997.

NOTES ON DISEASES.

The following diseases were not met with: Appendicitis, blackwater fever, cancrum oris, cholera, choleraic diarrhœa, dengue, enteric fever, measles, mumps, plague, pyæmia, rheumatic fever, rheumatoid arthritis, scurvy, and yellow fever.

I. *Beri-beri.*—One case only recorded.

II. *Circulatory System.*—Chief diseases, cases and deaths were as follows: Aneurysm, cases 12, deaths 3; endocarditis, cases 6, deaths 6; valvular heart disease, cases 106, deaths 26.

III. *Digestive System.*—Diarrhœa, cases 541, deaths 102. Hepatic ailments: hepatitis, cases 14, deaths 0; hepatic abscess, cases 11, deaths 6; hepatic congestion, cases 12, deaths 0; hepatic cirrhosis, cases 166, deaths 40; sarcoma of liver 1. Jaundice (cause not stated), cases 31, with 3 deaths.

Hernia appears a common ailment, 79 cases of hernia were treated, 7 being strangulated, of which 2 died.

Hæmorrhoids are fairly common, 44 cases in all were treated. Fistula in ano, 12 cases.

IV. *Generative System.*—Amongst the female ailments are included abortion 50; births 324; pregnancy 113; parturition 388; premature births 31. [It would be well were this group of cases included under a separate heading.]

V. *Lymphatic System.*—Elephantiasis cases 13; 12 being of the scrotum.

VI. *Urinary System.*—Two cases of renal calculi are recorded; no vesical calculi mentioned.

VII. *Nervous System.*—[The detailed account of the nervous diseases seems to have been omitted.]

Amongst the causes of insanity enumerated by the Medical Superintendent of the Public Lunatic Asylum at Berbice are: Malaria and its effects—20 out of a total of 183 being assigned to this cause. This would appear a new suggestion.

VIII. *Organs of Locomotion.*—One case only of ainhum is mentioned.

IX. *Respiratory System.*—Phthisis constituted 576 of the cases included under this heading, with 233 deaths; pneumonia cases 369, deaths 203; pleurisy cases 29, deaths 4; bronchitis and asthma cases 876, deaths 28.

X. *Cutaneous System.*—There occurred: chigoes, 18 cases; scabies, 97 cases.

XI. *Parasites*:—

	Cases.	Deaths.
Ankylostomiasis	428 ..	48
Ascaris lumbricoides ..	8 ..	—
Filariasis and Chyluria (1) ..	179 ..	5
Myasis	8 ..	1
Ringworm	7 ..	—
Tænia solium	— ..	—

XII. *Poisons.*—Cassava cases, 2; gange, 2; kerosine oil, 1; mercury, 2; opium, 3; snake, 7; no deaths.

OPERATIONS.

The major operations consisted of amputations of: breast, 4 cases; shoulder, 1 case; arm, 4 cases; thigh, 5; leg below knee, 17; ankle-joint, 3; partial of foot, 2. Three of the cases of amputations of the arm died, and one of the leg; the others recovered.

Twelve cases of elephantiasis scroti were operated upon, followed by 2 deaths.

LEPER ASYLUM.

Remaining, April 1st, 1903	434
Admitted lepers, 1903-1904	82
Readmitted	23
	539

Of this number 75 died, and 50 others left the asylum for various reasons.

ANNUAL REPORT OF THE GOVERNMENT VETERINARY SURGEON, MR. JOHN RALEIGH, FOR THE YEAR 1903-1904.

During the year 1903-04 epidemics of contagious and infectious diseases were not so frequent as in the year 1902-03.

Glanders.

In British Guiana cases of glanders are becoming fewer. During the year 1892 there were 3,001 cases of glanders in England. This, I believe, was due to an epidemic of influenza which prevailed. When we remember how the acute febrile disease has the effect of developing latent glanders, and thus converting non-infective into actively infective animals, there seems reason to connect the prevalence of influenza with the rise in the number of horses attacked in 1892.

Prevalence.—During the hot months of the year glanders is most prevalent, but of course in tropical countries this is not so noticeable. The explanation I offer of this fluctuation is that the hot months are more exhaustive, and that fatigue causes premature development of the disease, which might otherwise have continued latent in its pulmonary form. I assume that all visible cases of glanders have previously suffered from nodules in the lungs for at least two or three, and possibly for twelve months.

Methods of Spread.—Glanders is spread from horses suffering from a discharge, by means of pails, mangers, nose-bags, water-troughs, &c., or any other intermediate bearer of the active virus.

It is a disputed theory as to whether the disease can be spread by germs floating in the air, but when we consider that dried pus-cells float in the air there is ground to believe that the contagion can be carried in this way from one animal to another. Yet, on the other hand, we must not lose sight of the fact that grooms spend ten and twelve hours a day in infected stables without becoming inoculated.

The horse, showing no signs of disease, that works and eats month after month, whilst horses alongside are infected and destroyed by contagion from it, is an ancient, crusted legend. It dates back from the days when glanders without a nasal ulcer was not acknowledged, and when an enlarged gland, a chronic cough, or an intermittent nasal discharge, were not considered symptoms of glanders. It has fallen to my lot to investigate numerous outbreaks of glanders, and rarely have I not been able to find three or four horses showing clinical symptoms which had been overlooked by the owners and attendants. I venture to assert that the horse showing no signs of glanders is a non-

infective animal, even though his lungs be studded with nodules. Such a horse, though non-infective, is dangerous, because he may develop clinical symptoms very suddenly, and among them may be one accompanied by an escape of active bacilli.

Cause.—Glanders arises only by the introduction into the system of the *Bacillus mallei*, which is found in the discharges from the nostrils, farcy buds, infected glands, and nodules of the lungs.

The bacillus is destroyed when exposed to direct sunlight. It may remain active in clean water for many days. It is destroyed by thorough desiccation, and probably lives nowhere out of the animal body or a bacteriological laboratory for more than three months. It is easily destroyed by the more active disinfectants.

Diagnosis.—Some time ago the diagnosis of some cases of glanders was very difficult, but since the introduction of mallein we need have no difficulty, as an injection will, in 98 per cent. of cases, determine the nature of the disease in twenty-four hours.

Every nasal discharge should be treated with caution until its nature is evident. A unilateral discharge, or a discharge that continues without odour, especially when the appetite remains good, should be considered suspicious. Other aids to diagnosis are: the microscope, cultures on selected media, inoculation of small animals, and Willal's agglutinating test. Some of these are only of value in the hands of an expert bacteriologist. Others require days for their development. Mallein is more trustworthy, more simple, and much quicker. Every *post mortem* that I have performed after the reaction of mallein has revealed typical glanders. Several discussions have taken place lately as to the efficacy of this diagnostic agent, but nothing has been adduced to disprove its value.

Anthrax.

There has only been one sporadic case of anthrax throughout the whole year. This is striking testimony for the inoculation theory. Inoculation against anthrax has reduced the mortality in France from 20 per cent. to ¼ per cent.

Cerebro-spinal Meningitis.

In 1903 there was the sporadic form of cerebro-spinal meningitis among the mules at Pln. Hampton Court.

Diseases amongst Fowls.

During the year several epidemics broke out among owls.

Notes and News.

Vaccination in Turkey.—Throughout the Ottoman Government vaccination and revaccination, on the plan followed in Germany, is compulsory. This law came into force on April 18th, 1904.

Medical Holiday Courses in Berlin.—Particulars regarding the next course of lectures, which commence on March 1st, 1905, and lasts four weeks, may be obtained by applying to Herr Melzer, 10 and 11, Zugetstrausse, Berlin.

New Method of Water Purification.—Dr. G. T. Moore, Director of the United States Government Laboratory of Plant Physiology, announces that the addition of 1 part of sulphate of copper to 100,000 parts of water in a reservoir kills all bacteria in the water, and that the water may be safely used for drinking purposes, as all traces of the copper disappear in the process.

Major Ronald Ross.—Trinity College, Dublin, on December 20th, conferred the degree of Doctor in Science on Major Ronald Ross, C.B., F.R.S.

Lintine.—The highly absorbent substance known as lintine may be obtained from John Timson and Co., Limited, 104, Golden Lane, London, E.C. It consists of absorbent cotton fibres made into thin sheets suitable for dressings, bandages, tampons, pads, cushions, or obstetric napkins, of any desired shape or size.

The troops returning from Tibet brought with them two living specimens of the kyang, or wild ass of Central Asia.

Medical Inspection of Ships' Passengers.—The Government of Bombay have had under consideration the question of the abolition of the medical inspection of all persons on outgoing ships not coming within the provisions of the Venice Sanitary Convention, and have published the following resolution: "After carefully considering the question, the Governor in Council has come to the conclusion that inspection should be maintained for the present."

The cultivation of rubber is being seriously taken up in Ceylon. In October about 60,000 of the Para and Castillon varieties of rubber-trees were planted in the island.

Fight with Malaria.—Some interesting figures have recently come into our possession in this connection, says the *Sind Gazette*. The medical officer of a native regiment was determined, if possible, to reduce the very large number of cases of fever among the men under his care, and in July last began by applying kerosine oil to all the water where mosquitoes were likely to breed in the regimental lines, hospital, officers' quarters and mess, and a printed notice was also issued to the residents of all houses in the lines asking them to help by preventing the accumulation of stagnant water, &c. At the same time quinine was given daily for ten consecutive days to all the native children in the lines of the regiment, and after the first ten days quinine was given them on two consecutive days of every week. These combined measures appear to have had valuable results, for whereas from August 1st to November 22nd, 1903, the number of men who reported sick with fever was 1,002, between the same dates in the current year the number was only 35. As regards the children, out of 86 examined in July last, 11 were found with enlarged spleens. In October, out of 61 children only 2 had enlarged spleens. The children, also, were looking more generally healthy than on the first examination.

THE rainfall in Western India was deficient in September and October, and some local distress is contemplated.

IT has been decided to establish an Agricultural Board in India.

PLAGUE AND THE TOWERS OF SILENCE.—The attempt to attach importance to the Parsee custom of allowing the vultures in Bombay to devour the dead with the spread of plague does not find many supporters. Bombay is by some regarded as the focus from which India is being still infected by plague, but to charge the vulture of the Towers of Silence on the Malabar Hill in Bombay with the prevalence of the disease all over India is, on the face of it, an extravagant idea.

Geographical Distribution of Disease.

As information arrives we publish, under this heading, the principal diseases met with in tropical and sub-tropical countries, so that those interested in the Geographical Distribution of disease may have a means of gathering information concerning the prevalent ailments in different parts of the world.

Plague.

PREVALENCE OF THE DISEASE.

India.—During the weeks ending November 19th and 26th and December 3rd, the deaths from plague in India numbered 14,115, 14,528 and 17,728, respectively.

South Africa: Port Elizabeth.—During the weeks ending November 26th and December 3rd, fresh cases 0 and 0; deaths 1 and 0; under treatment 4.

Mauritius.—During the weeks ending November 15th and 22nd, fresh cases 11 and 14; deaths 9 and 6.

Hong Kong.—During the weeks ending November 26th and December 3rd, 10th and 17th, fresh cases 0, 0, 3 and 2; deaths 0, 0, 3 and 2.

Suez.—On December 27th, 1 case of plague.

Russia.—In two Stanitzas of the Ural territory, between November 24th and December 26th, 190 persons died of plague (?) (or a disease similar to bubonic plague).

Siberia. — Between October 18th and December 14th, 247 cases of plague have occurred in fur factories in the Vigatka and Slohodskai districts.

Brazil.—During the week ending November 9th 9 deaths occurred from plague. From January 1st to November 9th, 1904, plague has caused 193 deaths in Rio.

Tuberculosis in Brazil.

The annual mortality from phthisis and other tuberculous diseases in the city of Rio de Janeiro amounted, two years ago, to 60 per 1,000 of the population. Recently stringent rules have been drawn up and adopted by the Government for the suppression of, and protection of the community from, tuberculosis. Notification of all infectious diseases, including tuberculosis, is imperative, and it is the duty of any one and every one to report a case of tuberculosis, not only in their own families, but amongst their neighbours.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

Beri-beri.

Beri-beri in Manila.—The Filipinos and Chinese suffer severely from beri-beri in the Philippines. Americans are seldom attacked. The authorities are inclined to ascribe the disease to a meagre diet; rice and fish seems to be the diet most provocative of beri-beri.

Leprosy.

Röntgen Rays in Leprosy.—Experiments have been conducted in Manila to test the curative power of X-rays in cases of leprosy. The improvement in some instances has been encouraging. The hypertrophied ear of a leper was exposed to the rays at a distance of twelve inches from the ear for ten minutes daily. After a few weeks' treatment a marked diminution in size resulted, and several leprous nodules around the ear disappeared. In other experiments the lepers were made to revolve slowly in front of the rays. Noticeable improvement in leprous nodules is reported to have occurred.—*Medical Record,* December 3rd, 1904.

Plague.

Plague in Manila.—The last case of plague was reported in Manila on September 8th, 1904.

"The Sei-I-Kwai Medical Journal," Tokio, October 31, 1904.

(1) Statistics of the Japanese Naval Officers and Men Killed and Wounded in the Present War.

(2) On an Endemic Disease in Namanashi Prefecture. By F. Katsurada, M.D.

(1) Total killed and wounded officers and men in the Japanese Naval Service since the commencement of fighting, on February 9th, 1904, to October 9th, 1904, amounted to 2,321. Of this total, 1,022 are known to have been killed, or died of their wounds.

Ten naval surgeons were killed in action or drowned at sea. Six medical officers were wounded, and six were attacked by infectious diseases, but all recovered. In addition, nine medical attendants (*sic*) were killed or drowned, four were wounded, and thirteen were attacked by typhoid or typhoid fever.

(2) Katsurada publishes a paper on a disease caused by, or associated with, a special parasite previously unknown in Japan. An endemic disease with peculiar symptoms, accompanied by enlargement of the liver and spleen, has been known for many years, but it is only lately any light has been thrown on the subject. In 1888 Majima found the eggs of a special parasite in a case of cirrhosis of the liver. In 1900 Mikami published a clinical account of the signs and symptoms of the disease. In 1893 Shimohira and Murakami recognised the eggs in the liver. In 1898 Kanamori published an account of the eggs of a parasite in tumours he found in the rectum and liver, and, prior to Kanamori's announcement, Yamagiwa found, accidentally, at a *post mortem*, the eggs of a parasite in the

liver, which he termed *Distomum pulmonalis*. Subsequently Nüzuma met with the same eggs in the liver tissue of three dead bodies, and Kurimoto found the eggs in the fæces.

Geographical Distribution.—The disease has, so far, been met with chiefly in the villages situated in the basins of the Fuefuki and Kamanartie rivers. At Fugimimurie, during the five years 1899-1903, out of 201 deaths, there were 23 deaths assigned to this endemic disease.

Symptoms—Mikami describes the general symptoms of the disease as follows: The onset of the disease is gradual and indefinite. The appetite may remain good, but dyspepsia prevails. The abdomen is distended at the upper part, where an enlarged liver and spleen can be felt. The stools are soft.

In course of time anæmia supervenes, the skin becomes of a dirty grey colour, œdema appears in lower extremities, and ascites is common. Diarrhoea, with some blood in stools, and epistaxis are usually noted, but jaundice is rare. The temperature is, generally, below the normal, but occasionally a febrile state occurs.

Towards the end of the disease the liver atrophies and the patient may die of weakness or severe hæmatemesis. The duration of the disease is from two to thirty years. When children are attacked their growth becomes stunted. Further observations on this disease are promised at an early date.

Trypanosoma in the Small White Owl.

In a preliminary note published in *Archiv für Schiffs-und Tropen-Hygiene*, vol. vi., 1902, Dr. Hans Ziemann states that he has again found in a small white owl the same trypanosoma-like formations which he discovered previously in *Athena noctua* (refer to H. Ziemann's book, "*Ueber Malaria*," G. Fischer, Jena, 1898). Schaudinn, in his interesting report recently published in the JOURNAL OF TROPICAL MEDICINE, confirmed the trypanosomal nature of these forms. As was the case in *Athena noctua*, so in the small white owl, Ziemann was able to distinguish male and female trypanosoma, but even the most careful examination failed to discover any further development. In addition, however, to these trypanosoma, numerous halteridium in all stages of development were present. They corresponded with the ordinary halteridium in regard to the formation of gametes and the process of copulation, but differed from them inasmuch as that, in addition to the chromatin stained by Romanowsky's method, a distinctly circumscribed, round, darkly-stained granule was distinctly visible, even in the youngest stages. This dark characteristic granule could also be differentiated from the pigment and chromatin in the later stages of development. In living preparations it took the form of a distinct light-refracting round spot. All attempts to transfer these parasites to other birds failed. Proteosoma were very scarce in Cameroon. Ziemann found that even with the ordinary halteridium he could only confirm infection in 30 per cent. of the birds examined. He found, however, in studying snakes, that quite half of those he examined were infected with Drepanidæ.

Yellow Fever.

ABSTRACT FROM THE PRELIMINARY YELLOW FEVER EXPEDITION OF THE HAMBURG TROPICAL SCHOOL UNDERTAKEN BY DRS. OTTO AND NEUMANN.

(*Translated by the Liverpool School of Tropical Medicine, by the kind permission of Dr. Nocht, Director of the Hamburg School of Tropical Medicine. Published by permission of the Liverpool School of Tropical Medicine.*)

THE ANTI-MOSQUITO MEASURES IN RIO.

The extermination of the gnat in rooms is only possible through gases which have the power of penetrating everywhere. Houses are disinfected in the following manner: The Central (State) Office for the Prevention of Yellow Fever has to be informed at once of any new case breaking out, when a doctor, appointed by the Government, goes without delay to the infected house, accompanied by a number of men, trained for the purpose of disinfecting houses. The patient is taken to the hospital, unless he absolutely refuses to go there, but he is always taken if the house is in such a state to make it imperative. If he remains in the house a contrivance of nets is placed around him, and his room, which has been made air-tight, is fumigated with pyrethrum (insect powder). The patient remains in the room during the process of fumigating. The fumes stupefy the gnats, and in their agony they seek to reach the light of the window, and fall down at last on white sheets put down for the purpose. They are then gathered and immediately burned. At the same time all rooms in the house, and later on, the other houses of the neighbourhood within a radius of ten to twenty miles, are fumigated with sulphur. Every time subjects for testing are brought by the men, *i.e.*, gnats in small gauze boxes, which are put up near the ceiling; the death of these proves that the method has been effective. After airing the house thoroughly and clearing it from gnats, one of the rooms is provided with wire gauze windows and doors, and the patient placed in it for the whole time of his illness. For better security the room previously occupied by him is again fumigated. The matter is far simpler, of course, if the patient can be sent to the hospital. The whole house and the adjoining parts are then singly fumigated with sulphurous acid. We attended such disinfections several times. The work was highly interesting, especially as not only those yellow fever houses in Becco da Maëda, but also a small brewery close by had to be cleared of gnats.

Here we witnessed some splendid work which was quickly and most carefully carried out by the well-trained men. How tremendous the task was can be gathered from the fact that over 1,000 square metres of paper were used in making the large open halls and rooms air-tight. The storerooms for the bottled beer were swarming with Stegomyia gnats, which found nourishment from the moisture of the corks. When the process of fumigating was finished the floor was covered with dead gnats.

MOSQUITO BRIGADES.

In the same thorough manner, and with the same success which accompanies the clearing of infected houses, the extermination of the insects is executed in the whole town. This gigantic undertaking keeps a small army of 2,000 men employed, whose task it is

chiefly to hunt up breeding places, such as stagnant water in gutters, waste pipes, barrels, ditches, empty food tins, &c., and to destroy the larvæ.

This is done, for instance, by sweeping out gutters. Over large surfaces of water petroleum is poured; empty tins and other receptacles are collected. A bye-law decrees that a certain kind of fish (*barrigudo*), known for its greed, has to be kept in all parks and garden waters, &c. These fish are in the habit of destroying everything they cannot eat. The walls of such artificial ponds or lakes must be perpendicular, to allow the fish to get everywhere easily at the larvæ of the gnats. The drains for rain-water, &c., which form a vast network of pipes close under the surface of the streets, harbour a large number of gnats. To exterminate them it has been divided into ten districts, which are separated by firmly closing locks. The openings from above, as a rule covered with iron grids, are provided with gnat-proof wire netting fastened from underneath, sulphuric acid is in different places introduced through the manholes by means of a Clayton apparatus, and the poisonous gas allowed to stream even into the smallest branches of the drainage system. After a very short time swarms of gnats are seen under the wire gauze to which they go to find an outlet, and, of course, die. This process is repeated at certain intervals in each part of the town, several times during the year. At the same time it serves a second important purpose, *i.e.*, that of killing the numberless rats.

In this case we also find that subjects are tested to prove the efficaciousness of the method, and there is, further, the chemical analysis of the gas. This manner of exterminating rats at Rio is made possible because the street drainage is there placed above the sewer. Whether it would be practical to exterminate in the same way the rats of our city remains to be proved.

Methods to Stamp out Yellow Fever.

In order to stamp out yellow fever entirely, it is an absolute necessity to bring every case under the notice of the authorities, so that the requisite measures may at once be taken. These consist of isolating the patient under the net (to prevent any gnats from infecting themselves), and, on the other hand, in exterminating the already infected gnats. In spite of the law as to reporting every case it may, for various reasons, happen that the Central Office is not informed. To prevent such occurrences, several plans have been adopted; enquiries are, for instance, made on the slightest suspicion, and doctors' prescriptions are examined at the dispensaries in order to find out through them if there are any new cases about, the remedies used for yellow fever patients being all very similar. It facilitates matters considerably that every prescription has to bear the patient's exact address (name of street and number of house).

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(*To be continued.*)

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1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the Journal of Tropical Medicine should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communications.

NOTES ON CASES MET WITH IN SOUTH WESTERN ABYSSINIA IN MARCH, 1904.

By Charles Singer, B.A., M.B.Oxon., M.R.C.S.Eng.

(With Illustrations, see Plate.)

I was fortunate enough, during the earlier half of the year 1904, to be a member of an expedition under the direction of the American explorer, Mr. W. N. McMillan, and of Lieutenant-Colonel Sir John Harrington, British Minister to Abyssinia. The expedition, starting from Khartoum in January, ascended the White Nile and passed up the Sobat, an affluent which runs into the White Nile from the east. We then turned up the Baro River, itself a tributary of the Sobat, and, having travelled as far up this stream as we could in our boats, we landed, ascended the Ethiopian plateau, and traversed the Abyssinian Empire from west to east, reaching the coast in June, 1904. The greater part of the overland route lay in about latitude 8½° N.

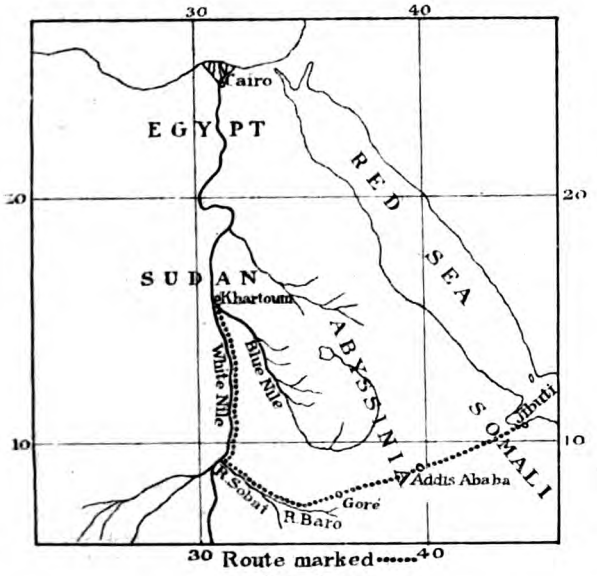

Fig. 1.

It was during the month of March that the ascent from the low country of the Baro and Sobat valleys to the high Abyssinian table-land was made, and notes on some of the cases met with at this period may be of interest.

I.—Cases of Thyroid Growth.

(1) Cases of goitre were met with throughout our route across Abyssinia, but were much more common in the western than in the eastern part. The cases were usually of a parenchymatous type (figs. 5 and 6) but adenomatous and other forms were met with, and Graves's disease (see below) seemed far from rare. All the cases of goitre that I saw were in the plateau itself, and I saw none in the low country forming the valley of the Sobat and Baro Rivers, which are inhabited by Negro tribes of quite different race to the Gallas and Abyssinians of the high country.

The highlands of Abyssinia are of a very mountainous and uneven character, and are well wooded. They lie, in great part, 4,000 feet and more above sea-level. "It has been asserted," says Mr. Berry,[1] "that goitre is not so prevalent on the most exposed parts of mountains, but occurs rather upon the slopes of mountains," but the inhabitants of these regions, among whom goitre is certainly common, exhibit a remarkable predilection for hill-tops as the sites of their villages and towns. The geological conformation of the southern part of Abyssinia is very complicated and little known. It is mostly volcanic in origin, and consists largely of a red, crumbly, tufaceous rock, with frequent outcrops of crystalline limestone.

The case from which figs. 5 and 6 were taken was of some interest. The man was aged 27, well nourished and developed, and lived at Goré. The tumour, which was of five years' growth, and of enormous size, was of a parenchymatous type, all portions of the gland being enlarged and the lobes showing particularly well and symmetrically (see fig. 5). The size and weight of the tumour give the back the curious arched form which has been figured by Mr. Berry in cases of large goitrous growths,[2] though he gives no goitres of this type of the size and symmetry of the one in question. The large parenchymatous thyroid growths met with in Europe are almost always markedly asymmetrical,[3] and I do not know of records of goitrous symmetrical growths of this size, for both the plates and descriptions of the monstrous "thyrophraxies" of Alibert[4] leave one in doubt as to their goitrous nature. The growth exhibited a trilobed form, and enlarged vessels could be seen and felt coursing over the surface of the gland. The patient had a greatly enlarged heart, and marked tachycardia, which became worse on movement that was at all protracted or violent. There was little dyspnœa in spite of the great size of the growth, so long as the patient remained still, and this was perhaps on account of the dependent position that the gland had assumed, so that it pulled upon, rather than pressed on or clasped the trachea. Slightly prolonged efforts, however, or movements in any degree violent, brought on attacks of dyspnœa which were, presumably, largely of cardiac origin. There was no exophthalmos or tremor. A diastolic murmur was present, loudest at the aortic cartilage and traceable down the left side of the sternum, but the pulse was not markedly collapsing. The patient complained greatly of the sensation of throbbing in his neck and head, and of faintness and inability for work. His family were healthy.

(2) Fig. 4 illustrates the incidence of a number of cases of Graves's disease in a family. Two brothers, aged 10 and 13, and a sister aged 12, as well as their mother, four members of the same family, were all affected with more or less typical exophthalmic goitre. I was not able to see the mother—she was said to have a swelling in the neck and prominent eyes—but of the three children I give a photograph. In each

[1] James Berry, "Diseases of the Thyroid Gland," London, 1901.

[2] *Loc. cit.*, fig. 36, p. 79.

[3] Berry, *loc. cit.*, figs. 34, 39 and 46.

[4] J. L. Alibert, "Nosologie naturelle," Paris, 1817, pp. 466-470, and plates C and D.

case the goitre was small. Tachycardia was present in all three, but only the girl and the elder boy had any exophthalmos, and in neither case was the symptom very well marked. Stellwag's sign was present in these two, but von Gräfe's was absent. Fine tremors were present in all three, and they were very nervous, excitable children. In all there was slight cardiac hypertrophy.

Graves's disease not infrequently shows itself in several members of the same family, and has been observed in three successive generations. A remarkable case is on record in which an hysterical woman had ten children, of whom eight suffered with exophthalmic goitre, and one of the latter had three children thus affected.[1]

In children, however, the disease is a rare one. Thus, among 96 admissions for the disease at St. Bartholomew's Hospital, between 1884 and 1898, there were none under 15, and the decade of greatest incidence was between 20 and 30[2]. Drs. Ord and Mackenzie state [3] that among 495 cases only 15 were under 10; while Dreschfeld,[4] writing in 1898, could only find records of 24 cases of the kind, though there are now doubtless far more. As regards the influence of *locality* in the etiology of Graves's disease, it is said to be met with more frequently in districts where goitre of ordinary type prevails than in other parts.[5] In South-western Abyssinia, between the edge of the plateau and the capital, Addis Ababa, I came across two other cases of Graves's disease, both in adult women, making the total of six in all, counting the four in one family. There can be no doubt of the frequency of occurrence of ordinary goitres in this region, but my cases were far too few, and taken, as a result of the exigencies of travel, in much too arbitrary and random a fashion for any statistical argument to be drawn from them. I know of no statistics of the relative frequency of occurrence of Graves's disease among coloured races as compared with whites except the statement of Professor Eshner, of Philadelphia,[6] drawn from records of 227 cases, that it is uncommon among people of colour. All my own cases were in Gallas and Abyssinians, and none were in Negroes. It has been said [7] that tremors are not present in very youthful cases, but they were present in all three of mine, and they were present, though they are now only very faint, in a case which has been attending St. Mary's Hospital for the last eighteen months, under Dr. Sidney Phillips, which by his kindness I have been allowed to see and quote. In this case, a child aged 9, the symptoms, *i.e.*, goitre and tremor, developed first about two years ago. There is no exophthalmos, and tachycardia is not now so marked as it was formerly. The growth pulsates and becomes much smaller when the patient lies down. There are no other cases in the family.

II.—Cases of Varicose Groin Glands and Elephantiasis.

(1) Figs. 2 and 3, Fayesa, a Galla, about 40 years of age (men of this race rarely know their exact age), presented himself to me in camp for treatment, at Bourre, a town on the western edge of the Abyssinian plateau.

He had an enormous swelling springing from the groin on the right side. The swelling was slightly movable on its base or pedicle. It was painless, and he suffered only from the inconvenience that its great weight caused him. The mass was hard, with about the consistence of gristle. The skin over the mass was slightly thickened, but not truly œdematous, as may be gathered from the presence of grooves and creases shown in the figures, and was to a limited extent movable over the subjacent tissues. There was no mark of ulceration present or past about the mass. Common sensation was present on the skin covering the mass, but was diminished in acuity. There were no veins or large vessels prominent upon it.

The right femur was bowed outwards by the mass. The man walked with a slow, awkward, waddling gait. The right leg was perhaps very slightly œdematous, but there was no obvious pitting on pressure. No varicose veins were present. As may be seen by an inspection of fig. 2, the groin glands of the left side were also considerably enlarged, the enlargement involving both the inguinal and femoral set. The scrotum and penis were perfectly normal and were not involved in any way. There was no perceptible enlargement of lymphatic glands elsewhere.

The history, which was obtained with difficulty, owing to the patient speaking a dialect not properly understood by any member of our caravan, was that he had first noticed the growth about twenty years ago, and that it had been growing steadily and uniformly since then until it had attained its present size.

The patient's son, a lad aged 10, had also enlargements in both groins. They were in his case about half the size of the closed fist, and painless. There were no other lymphatic enlargements to be seen in the boy. In him they had been slowly and painlessly enlarging for about two years. The skin in this case was movable over the swelling, but the enlarged glands were attached to the deep underlying structures.

The cases in both father and son were doubtless cases of varicose groin glands, which, in the instance first described, had become enormously developed. It is pretty clear that the growths were due to enlarged lymphatic glands, and were not comparable to the pedunculated elephantoid tumours due to the involvement of limited skin areas, such as have been described as inguinal tumours by Dr. Corney in Fiji and Dr. Daniels in Fiji and Demerara.[8]

[1] Osterreicher's case, quoted by Drs. W. M. Ord and Hector Mackenzie, in Allbutt's "System of Medicine," article "Graves's Disease." Another similar remarkable case has been recorded by Dr. Julius Rosenberg (*New York Medical Record*, 1890, vol. xxxviii., p. 605), in which there were three children of one family affected, both parents and an aunt also being affected, and one of the children developing the disease at eight years of age.

[2] Berry, *loc. cit.*, p. 177.

[3] *Loc. cit.*

[4] *Practitioner*, N. S.

[5] Dr. Savage, quoted by Berry, *loc. cit.*, p. 177, found, however, that "among 1,000 cases of goitre in a goitrous district of the north of England there was not a single case of Graves's disease."

[6] Vide *Medical Press and Circular*, August, 1898, p. 191.

[7] Dreschfeld, *loc. cit.*

[8] Quoted by Sir Patrick Manson, "Tropical Diseases," 1903 Edition, p. 593.

I do not know of a record of a non-malignant lymphatic grandular growth reaching such a size, though the cases of huge lymph-scrotum and elephantoid tumours figured in the text-books of tropical medicine, and by von Hebra[1] and others, greatly resemble the tumour in question, in size, position and appearance, though not in origin.

There was no history obtainable of repeated attacks of lymphangitis such as can often be obtained in cases of elephantiasis.

Cases which can be interpreted as elephantiasis are rather rare in the region where this one occurred. They do occur, however, and I describe shortly such a case below, in which the penis was chiefly involved.

(2) Fig. 7 was a healthy man of middle life, living in the same district as the case last described, in whom the penis, and to some extent also the scrotum, had been swelling for the last four to five years. There was a history of lymphangitis. The case is doubtless one of elephantiasis, affecting chiefly the penis, which has attained a great size. The patient was an Abyssinian (Shoan) by race.

III.—Case of Osteoma (?) Growing from Upper Ribs.

Figs. 8 and 9 illustrate another instance of "virgin pathology," met with in the same part of the country.

Projecting from the thoracic wall, on the left side, was a large tumour, about the size of the patient's head. The tumour was apparently of osteomatous, or chondromatous nature, and had taken some years to reach the size shown in the illustration. It grew, apparently, from the upper ribs, or from one of them, and was not attached to the humerus, the head of which could be felt rotating in the axilla. The skin was not involved, nor was there any ulceration or abscess formation, or other signs of breaking down. The skin was movable over the hard mass, which was painless. Large vessels can be seen in the figures coursing over the surface of the tumour. There was no sign of egg-shell crackling, nor did the tumour pulsate, though the throbbing of the large vessels on the surface could be distinctly felt. No secondary growths were found elsewhere. The nipple was hardly displaced (see fig. 8), the growth being almost entirely external to it.

The patient, a Galla, suffered little inconvenience from the presence of the tumour, except that he was unable to bring his left arm down to the side.

IV.—Leprosy.

Cases of leprosy were met with throughout the route across Abyssinia. Both the anæsthetic and nodular types were met with, and the disease seemed very prevalent, indeed, a large proportion of the patients who presented themselves for treatment were afflicted with this malady. The disease, therefore, in this region, certainly extends south of the ninth parallel (see fig. 1). In the low country of the Sobat and Baro basin I came across no cases of leprosy. This does not prove that there are none there, because the naked tribesmen of that part, Nuers, Anyuak and Yambo, are much less ready to present themselves for treatment than are the relatively civilised Gallas and Abyssinians. I think, however, it must certainly be rare in the low country; rare, that is, as compared with its frequency in Abyssinia proper, because leprosy is not a disease which, if common in a country, can very well escape the notice of the traveller, even if the sufferers do not come to beg for treatment.

It is worth noting that the inhabitants of the Sobat basin (among whom leprosy is rare or absent) live very largely on fish. All their villages are built on the rivers or very near them, and often at night, on the Sobat, the whole river seems ablaze with the torches of the fishing canoes. The fish they eat both fresh and dried. In the Abyssinian highlands, on the other hand, where leprosy is very common, fish forms a very small part, if any, of the native diet; for here there are no large rivers, and the natives have their flocks and herds, and grow large quantities of dhurra and other corn.

V.—Hill Diarrhœa (?)

In ascending from the Upper Baro to the plateau, we rose in two or three days' time from the hot low country where we had spent the previous two and a half months, to an elevation of about 5,000 feet. At this period four of the six whites who then composed the party were affected by a painful and frequent diarrhœa. The stools were copious and frothy, mixed with mucous, sometimes with streaks of blood. The attacks passed off in three or four days' time, and all were over in a week from the outbreak. As our diet had not changed during this period, the attacks must be attributed to climatic influences, or differences in water supply, and I group them together as "Hill Diarrhœa," perhaps comparable to the disease met with under similar circumstances in India. Our Somali and Abyssinian servants did not seem to be affected by the change.

[1] Hans von Hebra, *Wiener Klinick*, vol. xi., 1885, p. 217, *et seq.*, "Elephantiasis Arabum."

TUBERCULOSIS AMONG CIVILISED AFRICANS: SPECIAL PREVALENCE AND FATALITY.

By Major F. Smith, D.S.O.
Royal Army Medical Corps, Sierra Leone.

The Africans referred to in the title of this paper are the soldiers of the West India Regiment. These men, recruited from various islands of the West Indies, are descendants of the liberated people of bygone days. They are treated much the same as white troops with regard to clothing, housing and rations. The stations permanently occupied by the regiment are the West Indies and West Africa, both having warm, sunny climates, and the latter being the place from which, presumably, most of the men's ancestors came. In whatever station the men may be they suffer from tubercle to an abnormal extent as compared with other troops. The following table exemplifies this.

In no part of the Empire do the European soldiers suffer to anything like the same extent as the West Indian.

TABLE I.

Incidence of Tubercular Diseases at Home and Abroad.

(Extracts from *Army Medical Report*, 1898.[1])

Stations	Ratio per 1,000 for 10 years, 1888—1897			
	European Troops		Non-European Troops	
	Invalids	Deaths	Invalids	Deaths
West Indies ..	1·49	0·33	7·36	3·02
West Africa ..	0·00	0·00	3·32	5·24
United Kingdom	1·86	0·79	—	—
Gibraltar ..	1·19	0·47	—	—
Malta	1·32	0·84	—	—
Canada	1·47	0·91	—	—
India	1·22	0·79	—	—

In more recent years the West Indies have been subdivided in respect of medical statistics, and a West India Battalion has been stationed in Bermuda. Figures for separate stations are given below.

TABLE II.

Incidence of Tubercular Disease in certain Foreign Stations.

(Extracts from *Army Medical Report*, 1902.)

Station	Ratio per 1,000				
	European Troops		Non-European Troops		
	Invalids	Deaths	Invalids	Deaths	
Jamaica ..	1·92	0·70	7·85	2·42	10 years (to 1901).
Barbadoes.	1·56	0·78	6·27	3·76	
Bermuda..	0·88	0·73	9·63	5·78	3 years (1899–1901) for non-Europeans, 10 years (to 1901) for Europeans.

In 1898 a portion of the 3rd West India Regiment was stationed at St. Helena. The average strength was 188. There were two deaths from tubercle: number of invalids not recorded.

The later returns for this station are not yet forthcoming. St. Helena is included in the South African command, and the ordinary returns have been suspended with a view to inclusion in the Medical Report of the war.

TABLE III.

Incidence of Tubercular Diseases on Two Classes of Soldiery in Sierra Leone.

Year	West African Regiment			West Indian Regiment		
	Strength	Invalids	Deaths	Strength	Invalids	Deaths
1901 ..	1,082	0	1*	839	5	6
1902 ..	1,012	1	0	761	1	7
1903 ..	1,016	0	0	1,024	1	2†

* A Freetown man with a well-known Creole name.

† Battalion relieved by one from West Indies this year. "Unfits" from incoming battalion would be weeded out in the West Indies before departure.

During recent years there has been in Sierra Leone a regiment (The West African Regiment) recruited entirely from among natives of the Colony or hinterland. The men are all *country-men*, as distinguished from the Sierra-Leonian (or Creole as they prefer to be styled) descendants of released slaves planted in the Colony. We have, therefore, an opportunity of comparing the incidence of tubercle on the two classes of soldiers.

The excessive tubercle rate amongst West Indians in West Africa is no new thing. I have looked up the old manuscript mortality lists for the years before the Army Medical Annual Reports began to be issued, and I find that a large proportion of the deaths in the old days were from tubercle.

CUBIC SPACE ALLOWED.

I make no attempt to account for the predilection of tubercle for the civilised African. In the army the African lives under more favourable conditions, probably, than in civil life. In the matter of air space in barracks the regulation is that, "The cubic and floor space for native troops serving in their own country, *or in a similar climate*, is the same as that approved for British troops serving at home stations. This means in West Africa that the native gets the same amount of space in his home as the English soldier does in England. The allowance seems liberal enough. It has been the custom in Sierra Leone to treat the West Indiaman, in this regard, as if West Africa were his home. The white soldier in Sierra Leone gets an extra allowance of air space, decreasing in adverse proportion to the altitude of the station.

It would seem in accordance with modern ideas that instead of getting less space, the West Indiaman ought to get more than the European. That air allowance is a factor of much importance is doubtful, however.

There are no data by which we can arrive at a knowledge of the mortality rates among the civilised Sierra Leonians as compared with the "bush" men. The number of deaths registered as "tubercle" for the whole population of civilised and uncivilised is relatively less than the West India rates quoted.

Judging by some cases of rapid tuberculosis of organs other than the lung which have come under my notice among a small body of men in the prime of life, I should say that many tubercle cases among Negroes in malarious places are returned under other headings, especially among civilians, who do not always call in a doctor. In two of these cases the condition was diagnosed after death, and in another diagnosis was only made after much examination, consultation, &c., including two exploratory operations.

It would be interesting if those having to do with Negroes in other parts of the Empire than those mentioned above would publish their experiences with regard to the incidence of tubercle among their charges, for the subject may have a distinct bearing on prevention.

The main question is—Does the excessive prevalence of consumption and other tubercular diseases among civilised Negroes arise from unusual susceptibility, or is it a consequence of their mode of life?

AFRICAN SOLDIER AND "BUSH" MAN COMPARED.

The principal points of difference in manner of living between the civilised African soldier and the "bush" man seem to me to be in this connection, in West Africa:—

[1] I select this period because disturbing influences come into the statistical returns from West Africa after 1898.

Civilised.	Uncivilised.
Houses.	
Permanent site; large; durable in material; well ventilated.	Very small, majority have only one room; site less permanent; material requires frequent renewal; badly ventilated.
Fires.	
None in the dwelling rooms, except very occasionally during the "rains."	Fires constantly on the floor of dwelling room to keep the palm-leaf thatch in good order and the people warm; no chimney; rooms full of smoke.
Clothing.	
Woollen and abundant.	Cotton and scanty, or none at all. As a soldier he gets flannel shirts, a cotton suit and a woollen one. Goes bare-legged, and when off duty lives in the way he has been used to.
Susceptibility to Dry Cold.	
Not marked, but has an hereditary fear of cold; has also acquired from the white man a dread of night air and dew.	Extremely susceptible; hates a breeze; loves to squat over a fire, even in this warm climate.
Susceptibility to Cold Water and Wet Clothes.	
Same as Europeans.	Indifferent: as my native "boy" says: "We own clothes can soak pon we tey he dry—he no go do we notting." Bathing at any hour is universal; mothers may be seen sousing themselves and their suckling babes in the brook after sunset, and they use no towel afterwards.
Food.	
Same rations as European soldier.	Feeds himself. Rice, fish, palm-oil, cassava, fruit, and occasionally red meat, the diet, that is, on which he was brought up, but with more meat, owing to his having more money to spend; two meals a day, morning and evening, irregular as to time.
Alcohol.	
Very little compared with the average European.	Still less, but the non-Mahomedan part of them have occasional gin-drinking sprees, when they "jollify," as my servant puts it, and "dance the whole night long." Steady topers are rare.
Association with Europeans.	
The West India soldier lives side by side with Europeans in barracks. Rooms may be occupied by West India men after vacations by Europeans, and *vice versâ*.	The native soldier lives entirely apart, either among his own people or in cantonments of huts built in native fashion. Each man may have a room for himself and his wife.

With regard to the above, it must be stated that half the native soldiers live in the "bush" stations native fashion. A large part of the other half have lived in the cantonments at Wilberforce, Freetown, since the end of 1902. The "bush" troops are relieved every six months. This means that the men spend half the year in the "bush" and the other half in Wilberforce cantonments. Except that fires in the living rooms are discouraged, the men in cantonments live in much the same way as their civilian relations.

A SPORADIC CASE OF EXOPHTHALMIC GOITRE.

By L. E. Ashley Emile, L.R.C.P., L.R.C.S.Edin.
Mopra, Zambesi River, East Africa.

In reviewing the lists of diseases which have from time to time been published in the Journal of Tropical Medicine by various observers in East and Central Africa, no previous mention of exophthalmic goitre as a disease of these parts appears to have been noted, so I may presume that the disease must be very uncommon in these parts of Africa. During my own experience in Zambesia I have met with only a single case, the publication of which, though not a tropical disease, but occurring as it does in this tropical list, is of interest from a geographical point of view:—

Case.—Patient, a Kaffir, of the Coubo tribe, inhabiting the Zambesi district, was brought to the local dispensary by his brother suffering from a painful swelling in the neck and great difficulty in breathing.

History of Attack. — The following history was elicited: Patient, who is a labourer, working in the sugar plantation here, is said to have been in perfectly good health and discharged his duty in the fields in a satisfactory manner on the day previous to the attack; after the day's work he retired to sleep as usual, feeling quite well. During the night he is said to have been awakened by a visit from a hyæna to his hut, which frightened him a great deal. On rising in the early morning he vomited twice and complained of great pain in the neck. His brother, noticing something unusual in his appearance, brought him to the dispensary for treatment. His family history revealed nothing of importance, there being no hereditary tendency; all the other members have been in good health, and patient himself has never had a similar attack.

Present Condition.—Patient is a young man about 25 years of age, of spare build, and lighter in colour than the ordinary native of these parts, anæmic in appearance, and of marked neurotic temperament, displaying fits of restlessness and motion without any reasonable cause, and having a peevish and irritable disposition. The cardinal symptoms of the disease are well marked, viz., tachycardia, exophthalmos, enlargement of the thyroid and tremor.

Circulatory System.—Has tachycardia with increased force of the individual heart beats; cardiac impulse visible in natural position and diffused over a wide area; pulsation of the carotid arteries at the root of neck is also well marked and of a forcible and throbbing character. On auscultation a loud systolic bruit confined to the apex is heard, and another over the base corresponding to the pulmonary area traceable upwards into the neck; superficial and deep cardiac dulness normal. Pulse 96 per minute, of medium volume, low tension, regular in rhythm, and easily compressible. Face has a flushed appearance.

Exophthalmos.—Right eyeball presents a greater prominence than left, giving the patient a terrified and distressed appearance. There is want of uniformity in the movements of the eyeball and upper lid on looking down (v. Gräfe's sign), and the palpebral aperture wider than in health (Stellwag's sign).

Both these signs are better marked in right eye. Pupils and accommodation unaffected. Winking power very much restricted. Vision examined and found normal in both eyes.

Enlargement of Thyroid.—Right lobe enlarged to the size of a chestnut, soft in consistence and painful on pressure, skin freely movable over it. Thyroid tissues dilated and visibly versatile. Thrice elicited on palpation. On auscultation a loud humming murmur heard all over swelling. No enlargement of left lobe apparent.

Tremor is a characteristic symptom in this patient, the movements being fine and quite involuntary, increased on excitement or emotion, imparting to observer an impression of the patient's terror of impending dissolution. Headache severe and persistent, with giddiness and tinnitus producing slight incoordination when standing up from the sitting posture or attempting to walk. Knee-jerk retarded and diminished.

Other Symptoms.—Voice altered in tone, of a higher pitch than usual; breathing hurried and jerky in character. Nothing abnormal detected in the lungs. Has nausea (probably nervous in origin), clean tongue and good appetite. Bowels freely moved, urine normal. Skin moist, perspires a great deal. No pigmentation or any eruption on body.

Treatment.—Absolute rest in bed and light diet. On admission, calomel, grs. vi. at night, and sodii sulphates ʒi. dissolved in half a cup of warm water next morning to relieve vascular congestion. Counter-irritation in the form of Lin. Iodi. locally to gland, followed after a few days by inunction of red iodide of mercury ointment, B. P. Internally, small doses of opium as recommended by Musser.

After Notes.—The day after admission left lobe enlarged to the size of a marble, soft and painful on pressure. Temperature 100° F., pulse 96. Dyspnœa less. During next few days all the symptoms gradually subsided, and after a week's stay in hospital patient felt quite well and was discharged to duty.

Remarks.—There are certain points in the above case which are of interest and need some emphasis. (1) The extreme rarity of exophthalmic goitre in this part of Africa and especially among the native races in general, attributable to the fact that the African has less tendency to nervous diseases, particularly those of the functional type, so prevalent among civilised races. (2) Presence of severe pain in the enlarged gland, which is quite an unusual feature of the disease, and one which I have not met with in any other case. On referring to various text-books on medicine no mention is made of its existence. (3) That profound mental emotion produced by fright (the only attributable cause of the attack in question) is responsible for the disturbance of the vaso-motor system, as evidenced by the clinical symptoms, is in accordance with the consensus of opinion as to the neuropathic nature of the disease. (4) Finally, the rapid and complete recovery in a week.

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"PRE-INVASION" SIGNS AND SYMPTOMS IN DISEASE.

FROM a study of the signs and symptoms of certain diseases recently brought forward by several observers in different parts of the Tropics, it would appear to be necessary to recast our text-book descriptions to some, or even to a marked, extent. In the commoner ailments, such as scarlet fever, typhoid, small-pox, &c., the descriptions of the periods of incubation are passed over in our text-books, with a mere comment; the sum and substance being that indefinite symptoms may prevail during incubation, but they are of such a nature as to occasion no necessity for accurate description. In measles it is allowed that signs and symptoms of a common cold may prevail before the invasion period sets in, but this amount of admission is exceptional in other ailments.

How far this is true there is no means of know-

ing; clinical observation seldom begins until the stage of invasion develops with increase of temperature and it may be of rigors. We have become accustomed to accept this teaching, but we have no guarantee that it is true, and when we gauge these statements in the light of what we have learned lately in the case of plague and beri-beri, we have some reason to doubt the belief. In the case of plague we have dated our descriptions hitherto from the onset of fever with bubo, fever with pneumonia, or fever with evidence of septic-æmic infection. The observations of Dr. J. Bell and Wm. Hunter in Hong Kong have modified this clinical record. They have shown us that, before the so-called initial fever and bubo, there is a period of gastro-intestinal catarrh, attended by a preliminary rise of temperature occurring during what we have hitherto considered to be the symptomless incubation period of plague. They have even stated that the presence of the plague bacillus in the blood which was considered a late development in plague is nothing of the kind; the bacillus has been found by these observers in the blood of persons suffering from symptoms which did not even indicate that plague was threatening. Attention has already been drawn in the Journal to the epidemiological importance of these observations, but the matter goes deeper and opens up a wide sphere for investigation. Are we correct in assuming that in other ailments the symptoms during the incubation period are of secondary clinical significance?

In Beri-beri Dr. Hamilton Wright also draws attention to what we have termed "pre-invasion" symptoms. We are accustomed to regard a slight œdema over the shins, patches of anæsthesia over the front of the leg, the dorsum of the foot, the finger-tips and other parts, accompanied by marked pain when the calves of the legs are pinched, as the initial signs and symptoms of this disease. Dr. Wright, however, looks upon these evidences of Beri-beri as rather late developments, and describes a period of gastro-intestinal catarrh with a preliminary fugitive fever as yet earlier indications of infection. The Duodenitis theory of beri-beri advanced by Dr. Wright would explain the appearance of early alimentary canal infection in Beri-beri, and both clinical and *post-mortem* records point to the justification of the contention.

With these facts before us it behoves us to examine more carefully the symptoms of all our diseases during the incubation period; for by so doing, not only may the spread of infection be possibly curtailed, but means of arresting the disease even in the individual attacked might be undertaken with a greater degree of hope for successful treatment.

That malarial parasites are present in the blood long—it may be years—before feverish symptoms arrest attention is well known, and, could we call so extended a time the incubation period of malaria, we have another and most important addition to the diseases which exhibit definite indications of infection before recognised clinical evidence is forthcoming.

J. C.

THE LONDON SCHOOL OF TROPICAL MEDICINE.

Of the thirty-seven students who attended the above School during the Session October to December, 1904, the following eighteen passed the examination at the end of the course:—

Dr. D. H. Ainslie. With distinction.
Dr. D. Alexander (Colonial Service). With distinction.
Dr. D. A. Ashton (Colonial Service).
Dr. J. C. Carr.
Dr. J. H. Cook. With distinction.
Dr. T. G. D. Cooper (Colonial Service). With distinction.
Dr. R. Dane (Colonial Service).
Miss Kathleen Dawson.
Dr. W. A. Densham.
Dr. G. H. L. Fitzwilliams.
Dr. J. Gillies.
Dr. J. W. Gromitt (Colonial Service).
Dr. W. F. L. A. Holcroft (Colonial Service).
Dr. H. N. H. Joynt (Colonial Service).
Dr. A. C. Lorena (Colonial Service).
Dr. F. L. Norris (Colonial Service).
Dr. P. Phillips (Colonial Service).
Dr C. H. D. Ralph (Colonial Service).

Surgeon-General Alfred H. Keogh, C.B., has been appointed Director-General of the Army Medical Service.

Translation.

THE DEVELOPMENT OF HERPETOMONAS, A FLAGELLATE RELATED TO THE TRYPANOSOMA.

(Preliminary Communication.)

By S. Prowazek (Rovigno).

[Reprinted from *Arbeiten aus den Kaiserlichen Gesundheitsamte*, Part III., Vol. xx.]

(*Translated from the German by P. Falcke.*)

(*Continued from page* 7.)

The investigations made in regard to the stages of fission, and which will be described further on, bear out the correctness of this observation. The flagellate apparatus, which is of extreme importance in judging this form, consists of the following parts: (*a*) Two flagella intimately connected with each other by means of a sort of delicate membrane; they stain red by Giemsa's method, and are usually double the length of the cellular body. (*b*) A diplosoma which can only be observed under a high power and from which the flagella, as it were, sprout. (*c*) Two thicker intermediary pieces or rhizoplasts which, separated from the diplosoma, run towards the blepharoplasts; these are connected with the flagellate nucleus by a narrow thickened zone of protoplasm.

Laterally from the elongated flagellate nucleus, or blepharoplast, there is a button-like formation, from which proceeds a "double" thread, which has a distinctly spiral course and runs along the entire length of the body; a few isolated observations tend to show that the double thread seems to be connected with the ends of the two rhizoplasts. This thread or filament terminates in the posterior end of the body with an indistinct double granule. According to Schaudinn's opinion (compare his work in this Journal) the entire body of the flagellate is traced to a doubly flagellated trypanoplasma, folded together or bent back on its longitudinal axis. The undulating membrane of the trypanosoma, according to this investigator's observations, is traceable from a deviating central spindle; in the form here described the central spindle is inflected and remarkably stretched; it is again found in the double filament just described, the terminal "double granule" of which may be compared to a Flemming's intermediate body. The double thread is spirally twisted because the developing deviating central spindle experiences some resistance at its ends and thus induces a spiral turn such as is the case in the intranuclear central spindle of the nucleolus of the ciliates or the gregarines. Whereas, the central spindle of the trypanosoma is heteropole according to the investigations of Schaudinn, a condition which we shall be in a position to confirm here later on—and therefore as regards its pole functions unequally, it is comprehensible that the "pressure" of the one bifurcation of the bent central spindle predominates over the "pull" which is observable in the other filaments running parallel, so that there is a form-giving principle in the central spindle of this flagellate. The long, slender, stiff form of the flagellate is a product of the powers of the inflected long spiral central "spindle," or of the central filament, and to which with a few phylogenetic alterations the axis filaments and axis rods of the Trichomastiginæ, Trichomonadæ, Chilomonadæ, &c., may be traced back. The last remains of an undulating membrane are also to be found in the herpetomonas in the delicate, occasional membrane which is stretched between the two flagella.

The movement of the creature is very characteristic, and may be compared to a stiff needle, to which is threaded a whip-like swinging double thread.

The too flagella, not rarely, tear off from their blepharoplast, and then swing about independently for about seven minutes with their basal bodies and rhizoplast parts.

The parasites frequently agglomerate in thick rosettes (fig. 3) in the proventicle or posterior part

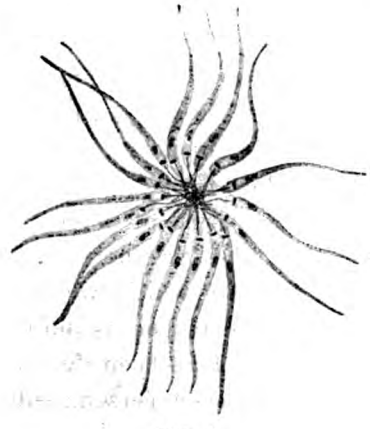

Fig. 3.

of the intestinal tract, when a mucous substance is secreted between the flagella. This kind of agglomeration is fundamentally different from that of the trypansomes of rats, but both methods can be brought to coincide by the consideration that the body axis primarily is bent back on itself, so that the morphological anterior end lies *next* to the posterior end. The agglomeration of the trypanosomes of birds investigated by Schaudinn also coincides remarkably with mine, inasmuch as, in contradistinction to the trypanosomes of rats, they also agglomerate at the flagellated extremity.

Both forms are to be traced back to bipolar trypanoplasma with two flagella, only in the course of phylogenesis sometimes one pole or the other has been suppressed. Herpetomonas is a terminal member of this development, as in it the axis is bent or doubled back so that the two poles lie side by side. The flagellata are rheotropical, and do move much with strong currents. This property is of advantage to them in so far as they are not immediately torn away with the moving masses of contents of the intestine. The property of rheotrophism is possessed likewise by the flagellate-like forms of the hæmatozoa, which must migrate at the spot of puncture of the mosquito into and against the direction of the circulation of the blood of the new host. (Compare Schaudinn's work.) I failed to keep the flagellates alive in Schulze's moist chamber for a longer period than twelve hours, at which term they always perished.

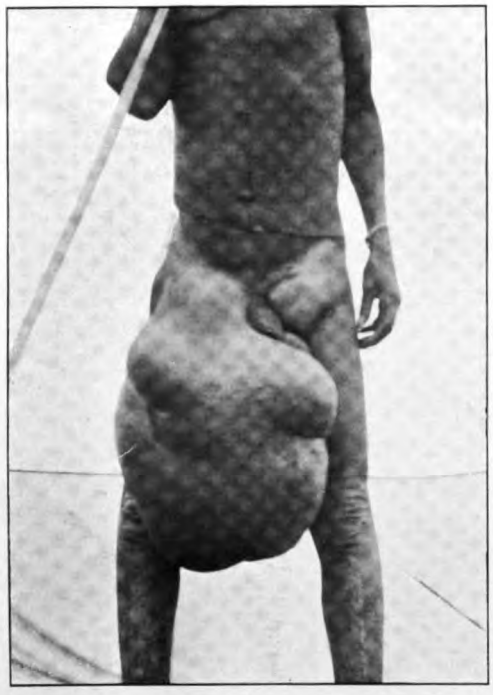

FIG. 2.

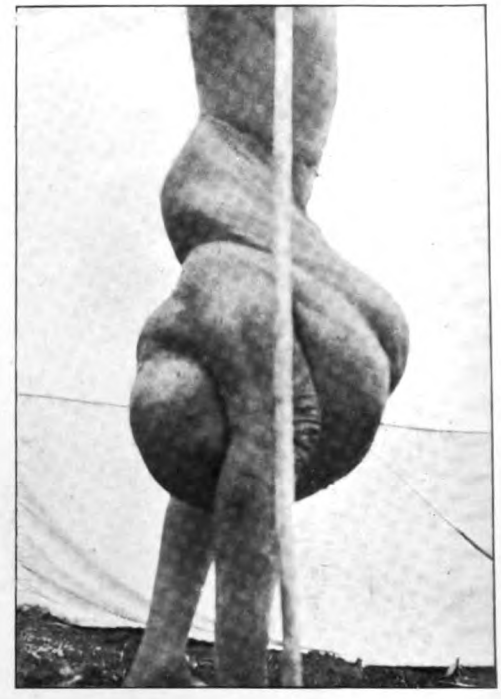

FIG. 3.

FIG. 4.

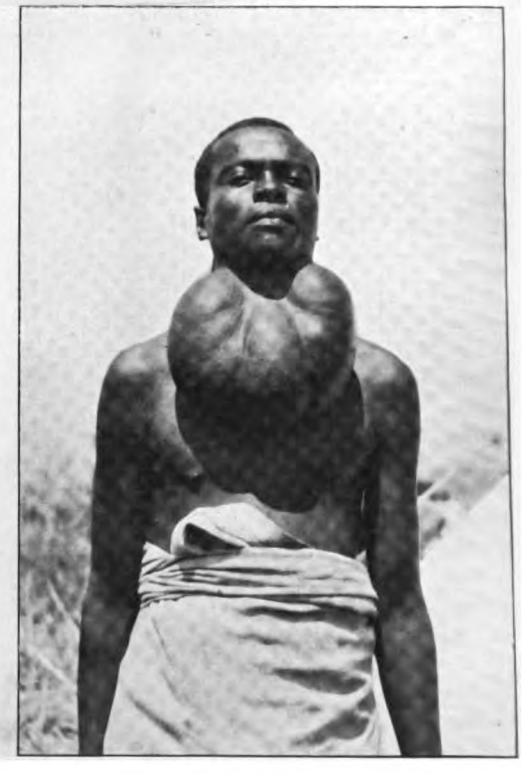

FIG. 5.

TO ILLUSTRATE NOTES ON CASES OF ELEPHANTIASIS AND OF THYROID GROWTH MET WITH IN SOUTH WESTERN ABYSSINIA IN MARCH, 1904.

By CHARLES SINGER, B.A., M.B.OXON., M.R.C.S.ENG.

Bale, Sons & Danielsson, Ltd.

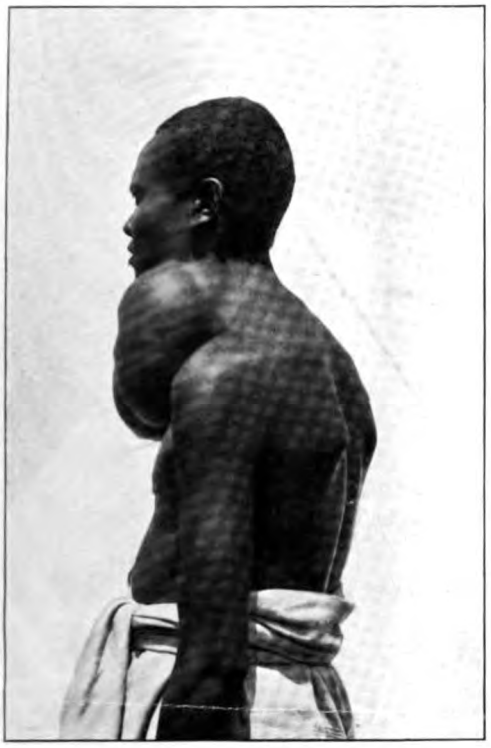

FIG. 6.

FIG. 7.

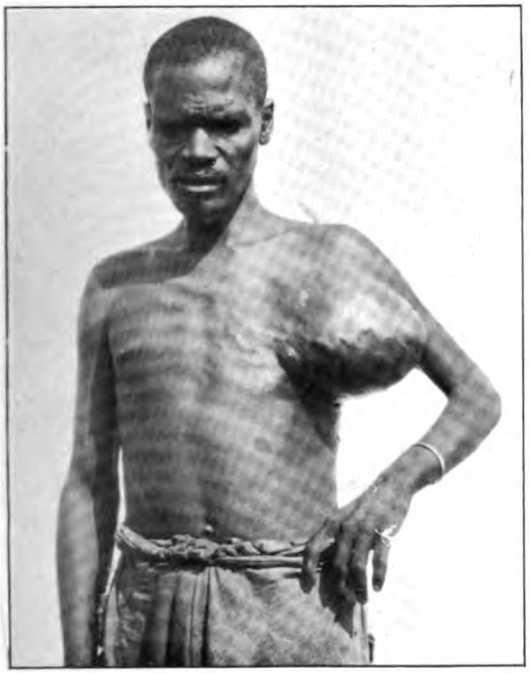

FIG. 8.

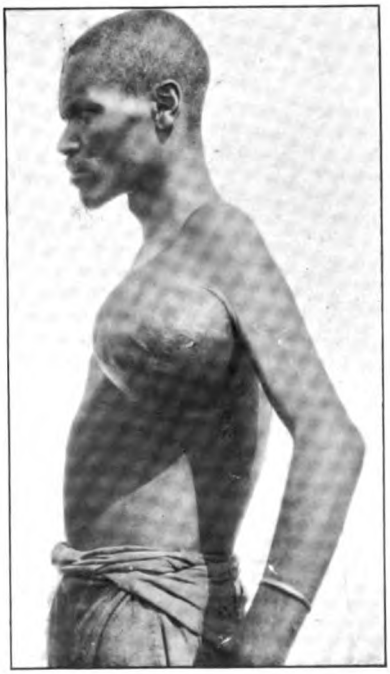

FIG. 9.

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The *Herpetomonas sarcophagæ*, n. sp., are very similar to the above form, but their form is more compressed, their protoplasm closer, and they possess a larger nucleus, richer in chromatin. The neuclus, in contradistinction to *Herpetomonas muscæ domesticæ*, which has eight chromosomes, appears to have sixteen chromosomes. When agglommerating the flagellates draw out longitudinally, and the cellular body possesses equally a long granular caudal process (fig. 3). Of each 100 flies examined eight on an average were infected.

Division.

Division is longitudinal (fig. 2, *b*). The two nuclei divide independently. The nutritive nucleus divides up according to the method of primitive mitosis, which represents a transition between actual mitosis and actual amitosis, as has already been demonstrated in numerous other protozoa. The chromatin in *H. muscæ domesticæ* collects into eight curved chromosomes, which arrange themselves into a sort of equatorial plate, and are divided from the interior body, which assumes a dumb-bell shape. The blepharoplast divides apparently by means of a tightening—which occasionally is only one-sided, so that a formation clover-leaf-like in shape ensues. In specimens suitably compressed one may, moreover, discern that the interior body becomes tightened dumb-bell-like and divided, and the masses of chromatin are distributed (fig. 2, *c*). Each individual, the result of the division, takes over one of the old flagella and with it a basal granule, which soon divides, and from which a delicate filament, the new flagellum, grows, and from which also, centrally and in the same manner, a new rhizoplast originates (fig. 2, *b*).

In a similar manner in reconstructions the old flagella become absorbed after lively periods of division connected with irregularities, and are immediately replaced by new flagella, which in size are more suitable to the bodies.

Besides these motile forms we find forms without flagella, immovable or with only weak, "worm-like" motion in those flies that have fasted and possess only a feeble or even no funnel-like or chitinous membrane in the mid-gut. The forms completely coincide with those described by Léger[1] as *Herpetomonas jaculum* from *Nepa cinerea*, and which he has termed "formes grégariniennes." He recognised their significance, and on the grounds of this observation he confirmed a certain relationship of the flagellates to gregarine-like sporozoa from the phylogenetic aspect:—

"L'existence de ces formes grégariniennes chez un Flagellé typique constitue un puissant argument en faveur de l'origine flagellée des Sporozoaires que j'ai déjà soutenue et que, d'ailleurs, Bütschli avait pressentie dès 1884."

Schaudinn drew attention to the relation of the Coccidia to the flagellates; Wettstein pointed out the connection of the malaria parasites with the flagellates.

In the forms mentioned the flagellate apparatus is more or less reduced, the flagellum is retracted, and the creatures mostly slightly curved to a sickle form. At this stage also they multiply by longitudinal division, sometimes, however, the portions remaining connected.

Under less favourable conditions of life the blepharoplast is drawn into the depths, and appears to relinquish some of its substance to the protoplasm, become simultaneously closer. The rhizoplast experiences a great shortening, and thus also draws the flagellum with its granule into the interior of the cellular body. Exteriorly a thick gelatinous envelope, which is stainable red after Giemsa, is exuded. It consists of a double row of granules, which later becomes mucous. In this manner permanent cysts are formed (fig. 4).

During their formation the cellular body occasionally degenerates, the exterior gelationous envelope then being much lobulated and pitted.

Fig. 4.

Copulation.

Copulation, which rarely takes place, possesses an original character in these forms, inasmuch as almost similarly constituted forms copulate with each other.

The one individual prepared for copulation is mostly only a little larger, and possesses a greater avidity for the pigments. According to analogy with the other flagellates it may be pronounced to be the female.

Before fertilisation the cells undergo a considerable reduction, in which the following visible parts are implicated: (1) The flagellate apparatus, and probably also the basal bodies; (2) the blepharoplasts; (3) the nutritive nucleus; (4) the central axis filament and its separate diplosoma.

As the two principal constituents of the cell (which here is heteroplastide), namely, the blepharoplast and the nutritive nucleus, are independent of each other, they are likewise subject to a periodically divided reduction, thus all parts subject to reduction are never found to be simultaneously affected, though occasionally the reduction nuclei of the central nucleus are very perishable.

Reduction of the Flagellate Apparatus.

The heteropole axis filament contracts spirally (fig. 5, *a*), thus conveying the blepharoplast attached to it into the depths. The rhizoplast likewise becomes shortened, and later on perishes, so that after the absorption of the flagella the two basal bodies are left lying free in the cellular body (fig. 5, *b*, *e*). The absorption of the filamentous differentiations takes place by means of knotty consolidations being formed along their course, and which swell and finally cause granular disintegration of the filaments. The two basal bodies likewise appear to divide and reduce their bulk; at all events, later on they become smaller, and are perceptible with difficulty. The diplosoma separated from the axis filament divides (fig. 5, *b*) twice into two and then four, still connected by fine threads; two of these granules again subdivide, and finally a heap of six granules are found in the posterior part of the cell (fig. 5, *c*). As, later on, various products of conversion and granular divisions of nuclei appear in the cell, I am no longer able to follow the ultimate fate of these in the masses of granules.

The blepharoplast undergoes two divisionary reductions (fig. 5, *b*, *c*). The first one is distinguished by a heteropole "spindle" (fig. 5, *b*), such as we are already

[1] L. Léger, "Sur la structure et le mode de multiplication des flagelles du genre Herpetomonas Kent, *Compt. rend. d. seances d. l. Academie d. Sciences*," Paris, 7 Avril, 1902.

acquainted with in a large number of protozoa and which, according to Reinke's statements, may likewise occur in the metazoa (connective tissue of a salamander larva). The second divisionary reduction is illustrated in fig. 5, *c*. The granule contiguous to the blepharoplast reduces its bulk by simple division.

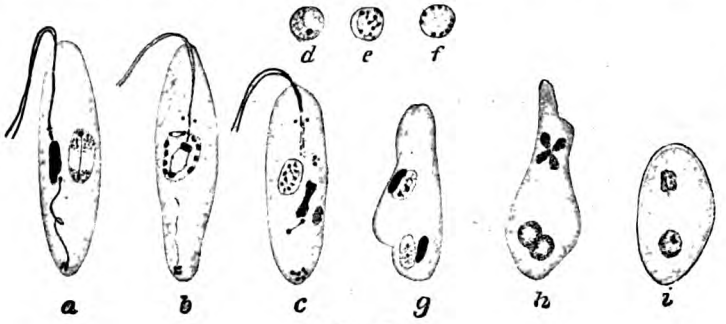

FIG. 5.

The nutritive nucleus swells before the reduction; its chromatin collects at one side in the form of a crescent, and its interior body becomes very distinct (fig. 5, *d*). Later on the interior body divides and four groups of four appear next to it, which are divided up by the two following divisions (fig. 5, *e*).

Before the second division one may see very distinctly the divided caryosoma (interior body) in the form of a central spindle, and at each side of which four chromosomes lie (fig. 5, *f*, *c*).

The divisionary reductions behave here as in those trypanosomes examined by Schaudinn; thus as complete but abortive divisions in which all the parts of the complicated heteroplastide take part, but of the products of which only the two nuclei advance to subsequent fertilisation, while the other organoids probably degenerate (basal granules, intermediate body), as the one or both nuclei are able to regenerate everything anew.

The fact of the reduction of the blepharoplast appears to be of particular importance in zytological speculations. The flagellates here described are true heteroplastides; their blepharoplast is nucleus-like and equally as potent as the central nucleus; the latter has, however, in no way deteriorated, but still represents a real centro-nucleus. We might perhaps compare the blepharoplast to a centrosome and its interior body (caryosoma), which like the metazoa (Boveri) divided first (fig. 2, *c*).

The blepharoplast is also a cyclical formation (Boveri) in a certain sense which, somewhat after the manner of an echinus-centrosome in cyst formation or in auto-copulative parthenogenesis, is exposed to a wholesale reduction at the decline of its function. Before fertilisation it is reduced like the centrosome in the spermatogenesis of the metazoa (*Helix*, distal part of the centrosome).

Fertilisation.

The fertilisation of our flagellata takes place by means of the two individuals lying side by side and then amalgamating, whereby the two blepharoplasts and nuclei each unite to a single formation (fig. 5, *h*, *i*). In fig. 5, *h* the two blepharoplasts before the amalgamation undergo a belated last reducing division.

Fertilisation in this form is combined with the formation of a permanent cyst (fig. 5, *i*), the further fate of which I have not yet been able to follow.

Under unfavourable circumstances, such as when the host is fasting or its intestine is undergoing desquamation and the "membranous funnel" does not envelope the intestinal contents, the gregarine or worm-like forms migrate through the epithelium of the intestine into the abdominal cavity and into the ovaries; of these forms a few (females) make screw-like or curved movements. By penetrating the ovaries thus it is possible that the *next generation of flies* may be infected.

Infection Possible in a Threefold Manner.

(1) The indifferent individuals form the mucous cysts described above, and in this manner are ejected with the fæces into the open (damp windows, foods, manure, &c.), and are again taken up by other flies which lick over everything with their sucking proboscis.

(2) The sexually differentiated forms copulate and form a permanent cyst which, in the same way as the mucous cysts, may cause infection.

(3) Sexually differentiated forms penetrate into the ovaries, where they undergo autogamy and infect the next brood. Our parasites accordingly appertain to the category of parasites that are "inherited." Germinative infection has been confirmed by Siegel in the *Nozema bombycis*, which is a parasite of the silk-worm; in a *Zoochlorelle* which occurs in the ova of the sponge, *Spongelia pallescens* (F. E. Schulze); moreover, in the *Hæmogregarina stepanovi*, in the ova of the leech; the same holds good in regard to the *trypanosoma of birds*, and in malaria, according to the recent investigations of Schaudinn. In addition, the germinative infection of the ova of the tick in the parasite of Texas fever, as well as the eggs of an acarus, which is parasitic in a lizard and transmits the hæmosporidia of the lizard (*Caryolysus*) (Schaudinn), are of pathological importance.

In cover-glass streak preparations of fresh fly-eggs which were washed in distilled water, I found the above described *yeast fungi* and *bacteria*, which were later confirmed in the intestines. Escherich is also of opinion that the blastomyces (that is, a parasite in the intestinal epithelium of the small beetle *Anobium paniceum*, which stands in symbiotic relationship to the beetle [Karawaiew, Escherich]), is transmitted by means of the eggs from generation to generation (compare Schaudinn's statements in regard to the Culicidæ in the work recently published in this Journal).

The brood is not always infected in all infected animal hosts; of twenty infected flesh-flies I found there was only one the brood of which was also infected. Moreover, all the larvæ of the same fly are not necessarily infected; this phenomenon may have some connection with the various stages of maturity in the ovarium of the insect, as, naturally, the invasion once accomplished, would by preference affect the more mature eggs unprovided, however, with the chorion.

The parasites first of all remain in the copious

vitellus of the ova, where they can be demonstrated alone in streak preparations; they are then, however, introduced into the interior in advancing development, proceeding from the anterior and posterior parts of the germinal streak which, according to Noak, form the mid-gut.

In such later stages of development of the egg of the fly they, just like parasites retained in the intestine of the mother-creature, undergo remarkable changes of nucleus, which in all essentials resemble those of the *Bodo lacertæ* or of the *Trichomatrix* in autogamy.

Summary of Propagation Processes.

In order to obtain a rapid survey, we shall divide them in three categories and briefly describe all.

(1) The *Blepharoplast* (the kinetic nucleus) undergoes two divisions of reduction; two nuclei originated from the division copulate, while the central nutritive nucleus degenerates more or less rapidly. The plasma of this individual is very light and stains light blue after Giemsa. We term these individuals *males*. The autogamy of the blepharoplast is therefore here connected with an *Etheogenesis* (which by parthenogenetic analogy may be termed the unmarried young man).

(2) The central nucleus alone undergoes two divisions of reduction, the descendants of which are subject to autogamy. The blepharoplast may again divide, but mostly remains in the reduced condition, or it degenerates. Autogamy is connected with a parthenogenesis—female individuals.

(3) Both nuclei undergo the same auto-copulative processes or simply divide—indifferent cells.

(1) In the first case (*Etheogenesis*) the blepharoplast divides in a heteropole manner; the compact spindle is obtuse at the one pole and pointed at the other. In this process a different development may even be confirmed of the one intermediate piece and the basal granule that appertains to it (fig. 6, *a*). Another division follows this one, in which now the two nuclei auto-copulate (fig. 6, *b*, *c*). The chromatin of the central nucleus agglomerates early, vacuoles occur in the nucleus and it degenerates (fig. 6, *a*, *b*); sometimes, however, this nucleus makes a start to a division, its interior alone dividing four times (fig. 6, *c*). The processes in the intestine of the parent creature and in the intestinal tract of the embryo are similar in all essentials, only that here mostly the individuals remain in the complete gregarine stage, whereas in the former case some still possess a flagellum which only later becomes reduced. One, however, sometimes finds more or less strongly developed flagellated forms in the vitellus of the eggs. Later on the individuals become rounded off and swell considerably, while the blepharoplast undergoes numerous divisions (fig. 6, *d*).

As from these forms, however, a nutritive nucleus perishes, they appear to degenerate sooner or later, for I never found any further stages of development.

(2) In the second case the blepharoplast is only partly reduced (fig. 7, *a*), or not at all, in parthenogenesis; on the other hand, the nutritive nucleus divides into four nuclei, of which two auto-copulate, while the other two reduction nuclei become smaller (fig. 7, *b*), and finally disappear altogether.

In a nucleus fertilised in this manner there springs up a constantly growing granule; stained after Giemsa, it stains light blue, and appears as a plastin-like mass which, constantly growing, forces the granular chromatin to the periphery (fig. 7, *c*.) At later stages of development a large vesicular nucleus is found in the dark protoplasm; it is very pale, and possesses, mostly in the centre, a small interior body

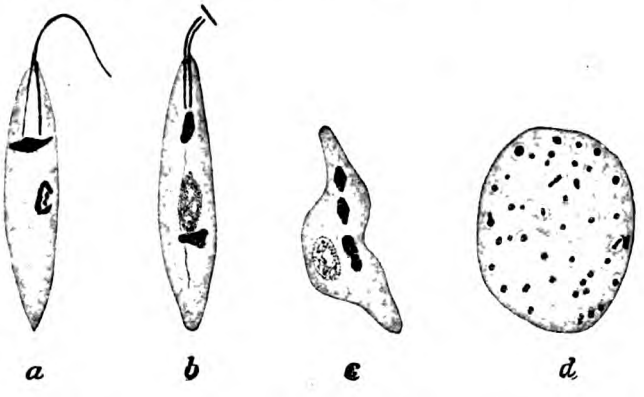

Fig. 6.—(*a*) The nutritive nucleus degenerates; heteropole spindle of the blepharoplasts; (*b*) second reduction division of the blepharoplasts; (*c*) autogamy of the same below; (*d*) etheogenesis.

or caryosoma (fig. 7, *d*), which, under certain circumstances, may also be divided heteropole. This large nucleus subsequently divides several times, and each time the chromatin as a rule agglutinates to three sausage-like masses. The blepharoplast divides several times independently (fig. 7, *e*), or it degenerates (fig. 7, *f*); granulations that stain red after Giemsa appear in the protoplasm (fig. 7, *e*, *f*).

(3) In the indifferent cells the two nuclei divide, as do the blepharoplast and the central nuclei, evenly but independently one of the other, and finally rosette-shaped new indifferent flagellates, which possess a nutritive nucleus and a blepharoplast, are divided off from the periphery (fig. 7, *j*). These stages are found frequently early in the uninjured intestine as well as in the abdominal cavity of the embryo, as they are of less complicated development than other forms, and thus fewer individuals perish.

In between the typical modes here described there are a number of other transitions and modifications. A few particularly characteristic appearances must be mentioned here. Under some circumstances only one or the other nucleus can accomplish its autogamy, while both are subject to further divisions, so that finally polynuclear cells with hybrid characteristics are formed (fig. 7, *g*, *h*). The consequence is that, according to the analogy of the organs and cells, there ensues a combat of the organoids in the cell which terminates either by (*a*) a portion perishing or (*b*) being ejected. These processes of elimination are likewise very interesting. Either some protoplasm with superfluous blepharoplasts or with the subservient nutritive nuclei is cast off in the form of a humpy protuberance, whereupon a membrane, stainable red after

Giemsa, is secreted on the periphery of the cells (fig. 7).

That part of the plasma that is extruded clings for some time to this kind of cyst. Should, however, the protoplasma of both portions be more equal one part degenerates, within the "cyst" (fig. 7,*i*), while the other portion produces normal individuals.

obtuse end forward.] The blepharoplast first divides in heteropole style asymmetrically, and then degenerates entirely. The process includes copulation, which has partly been observed in fresh preparations. Autogamy appears to take place (as is also the case in herpetomonas [fig. 7, *b*]) in the liver, and more rarely in the spleen.

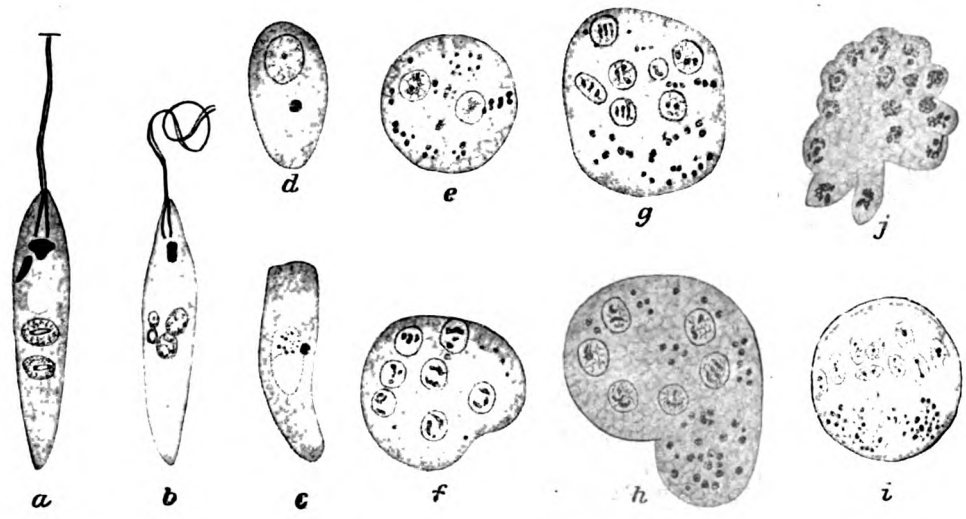

FIG. 7.—(*a*—*i*) Parthenogenesis. (*a* and *b*) Reduction, division, and autogamy. (*c*, *d*, *e*) Formation of the resting stage. (*e*) Increase of both sorts of nuclei. (*f*) Degeneration of the blepharoplast. (*g*, *h*) "Hybrid" stage of rest. (*h*) Tightening off of the blepharoplast with the protoplasm, formation of a membrane. (*i*, *j*) Degeneration of the blepharoplast within the "cyst," development of the females. Division of the interior body within the nucleus without chromatin. There is the indication of a heteropole at four places. The new blepharoplast is probably formed by the exit of the one part.

The processes are the more complicated by the fact that the protoplasm equally is subject to two formations appearing—namely, as a light-coloured protoplasm rich in fluid and poor in reserve material, as well as a dark-stained close protoplasm rich in reserve material. If we assume that the "agglomeration and thickening of the chromatin in the blepharoplast as well as the light protoplasm poor in reserve material" as characteristic of the male principle, and the "fine distribution of the chromatin in the large nutritive nucleus as well as the dark protoplasm rich in reserve material" as indications of the female properties, we are able, after minute observation of the separate resting stages, to come to the conclusion that the ubiquitous nucleus is not always brought equally into the correct place as to its protoplasm, so that frequently the large light nuclei are seen in the light protoplasm and *vice versâ* (fig. 7, *g*, *h*). These mistakes are rectified by the one portion causing the other to extrude when the corresponding assimilation of dissimilation alters the character of the protoplasm or degenerates.

I have not hitherto been able to confirm the manner of development of the flagellate apparatus.

I observed a two-fold reduction which also affected the blepharoplast, and which was combined with a formation of groups of four in the female individuals (stainable light blue after Giemsa) in *Trypanosoma brucei* (from guinea-pigs.) [These parasites, in contradistinction to *T. lewisi*, mostly swim with the

Notes and News.

HOSPITAL FOR STRANGERS IN ROME.—On the Coelian Hill in Rome the foundation of a new hospital for strangers have been laid. When completed the hospital will be under British protection, and will be available to people of every nationality, who will have the privilege of being attended by their own doctors. The hospital will be a great boon to the many foreign residents in Rome.

PROTOZOON-LIKE bodies have been found in vesicles produced in scarlet fever patients in five cases out of eighteen examined. Dr. Charles W. Duval has published this statement in the *University of Pennsylvania Medical Bulletin* for November. Mallory, in 1903, published a description of protozoon-like bodies he met with occurring in the epidermal cells, lymph vessels and spaces of the skin of scarlet fever patients

DR. JAMES M. BEATTIE, of the Pathological Laboratory, Edinburgh University, claims to have found the *Micrococcus rheumaticus* in the synovial membrane of a patient suffering from acute rheumatism, and recovered the organism from the vegetations of the endocarditis occurring in rabbits. This observation tends to confirm the announcement made in the *British Medical Journal* of January, 1904. by Drs. Beaton and Walker.

Review.

BERI-BERI, ITS SYMPTOMS AND SYMPTOMATIC TREATMENT. By Percy Netterville Gerrard, M.D. 8vo, pp. 95, with seven diagrams. London: J. and A. Churchill, 1904.

Dr. Gerrard, from experience gained in Kwala Lumpor, in the Federated Malay States, where he served as surgeon to the District Gaol, has produced a useful book on beri-beri. All that is known concerning the disease, its symptoms, complications, varieties and treatment, are clearly described. A smaller work, extending to fifty-three pages, by the same author, an extract from the above, deals with the clinical aspects of beri-beri. Both works are valuable, and should be obtained and studied by students of tropical medicine.

Remedies.

CHRONIC OTORRHŒA.—Ménière recommends: wash out the meatus with hot water, and then paint the walls with carbolic acid crystals 1 part, pure glycerine 5 parts.—*Nouveaux Remedes*, July 24th, 1904.

BLEEDING PILES.—Useful applications are: very hot water or very cold water, with or without 5 per cent. of alum. Pounded ice in a gold-beaters' skin may be introduced into the rectum! A valuable hot enema is carbolic acid 4½ grains, glycerine 7 drachms, boiled water 7½ ounces. A plug of cotton moistened with 50 drops adrenalin (1—1,000) mixed with a tablespoonful of water, kept in rectum for ten minutes.—*Presse Medicale*, July 28th, 1904.

Geographical Distribution of Disease.

As information arrives we publish, under this heading, the principal diseases met with in tropical and sub-tropical countries, so that those interested in the Geographical Distribution of disease may have a means of gathering information concerning the prevalent ailments in different parts of the world.

Ankylostomiasis in Collieries in Europe.

The Committee appointed by the British Association to enquire into "the probability of ankylostoma becoming a permanent inhabitant of our coal mines in the event of its introduction," has published an interim report which pertinently indicates the dangers likely to result were the parasite to obtain a hold upon the miners. As illustrating what has taken place by the introduction of the *Ankylostomum duodenale* into mines and collieries, Dr. Thomas Oliver's paper on "Miners' Worm Disease," in Westphalian and Hungarian mines, and published in the *Transactions of the Institution of Mining Engineers*, brings the severe nature of the ailment prominently forward. In one year in the town of Bochum, in Westphalia, with a population of 70,000, no less than 3,000 persons suffered from ankylostomiasis. Within a period of two years ankylostomiasis was responsible for a monetary loss of £100,000 in Westphalia alone. The heat and moisture prevalent in mines, especially where water is freely sprayed about to counteract the dust arising from the coal, are favourite media in which the ova develop into the larvæ of the ankylostoma.

The prophylactic measures recommended are: (1) The mines ought to be kept dry and cool. (2) Medical inspection and constant microscopic examination of the stools of miners. (3) Men suffering from ankylostomiasis must be prevented working in mines. (4) Latrines, with ample accommodation and carefully constructed, must be placed in the mines and the workers compelled to use them and not allowed to defæcate indiscriminately on the ground. The receptacles must be daily emptied and disinfected. In British mines it is necessary that all foreign workmen be medically inspected before being allowed to go to work. Unless prophylactic measures are taken it is probable that ankylostomiasis, which has already appeared in some Cornish mines, may become general, as the average temperature (about 70° F.) of mines in this country is quite sufficient to favour the development of the parasite.

Australia.

PREVENTION OF TUBERCULOSIS.

A branch of the British Association for the Prevention of Consumption has been formed in New South Wales. A city dispensary for Consumption is contemplated; but there is an inclination to thwart the formation of such an institution on the ground that it is unnecessary to multiply hospitals, there being already several Consumptive Homes in the Colony.

On October 14th, 1904, the New South Wales Branch of the British Medical Association advocated the compulsory notification of pulmonary tuberculosis and the erection of hospitals for advanced cases of phthisis.

Diphtheria.

The prevalence of diphtheria in New South Wales is attributed by the Chairman of the Board of Health, Dr. D. A. Gresswell, to improper ventilation and overcrowding of the schools.

Lunacy in New South Wales.

On December 31st, 1903, there were 4,950 officially notified cases of insanity in New South Wales. This is an increase of 263 upon the number returned for 1902. The average annual increase for the last twenty years has been 127.

Diphtheria in India.

MALLANNAH, S. *British Medical Journal*, December 31, 1904.—In Hyderabad only three cases of diphtheria occurred in the practice of Dr. Mallannah during a five years' experience. The specific bacillus was proved to be present by reliable tests, and albumen and renal casts were present in all three patients. Diphtheria in sporadic form evidently occurs in tropical countries.

The Health of India.

In the European army in India during 1902, the chief cause of sickness and admission to hospital was

venereal disease; no fewer than 281 per 1,000 of the total sickness being due to venereal complaints. The number of men constantly in hospital from these ailments amounted to 1,431.

Malaria was accountable for 247 per 1,000 of the total cases of sickness amongst British troops.

Venereal disease and malaria caused together 49 per cent. of the total sickness rate.

Enteric caused the greatest mortality, the death-rate from this disease being 4·29, a higher total than during 1901 by 1 per cent.

In the Native army *malaria* contributed 38 per cent. of the total admissions to hospital. *Venereal* diseases accounted for only 33 per 1,000 of the admissions, as compared with 281 per 1,000 amongst British troops. *Enteric* fever gave a death-rate of only 0·10 per 1,000, as compared with 4·29 amongst British troops. *Pneumonia* caused one-third of the total deaths in the Native army, being four times more than amongst British troops.

During 1902, amongst the general population, the chief causes of death were: Cholera 224,135, ratio per 1,000, 1·01; small-pox 115,603, ratio 0·52; fevers 4,291,952, ratio 19·17; dysentery and diarrhœa 266,869, ratio 1·06; plague 445,293, ratio 2·0. Total deaths from all causes 7,112,336, ratio per 1,000, 31·49.

Civil Hospitals and Dispensaries.—During 1902, 2,459 hospitals and dispensaries were open to the public, at which 372,780 in-patients and 24,039,114 out-patients were treated.

Plague.

PREVALENCE OF THE DISEASE.

India.—During the week ending December 10th, the deaths from plague numbered 17,439.

South Africa: Port Elizabeth.—During the weeks ending December 10th and 17th, fresh cases 2 and 0; deaths 0 and 0.

Mauritius.—During the week ending December 29th, 1904, and January 5th, 1905, fresh cases 19 and 9; deaths 11 and 7.

Hong Kong.—During week ending January 7th, fresh cases 1; death 1.

British East Africa: Mombasa.—On January 2nd, 1905, plague appeared at Port Florence: cases 6; deaths 4 to date.

Russia.—In Cossack and Khirgis villages, 33 miles from Guriev, pneumonic plague was reported on December 29th: 200 deaths to date had occurred.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

Actinomycosis in Egypt.

S. VORONOFF. *Gazette des Hopitaux*, November 22, 1904.—The patient was a native, aged 42, with a growth of sixteen years' duration, which had formed three fistulæ discharging thick sero-pus into the mouth; the openings were depressed and clearly defined, their edges were not indurated. The discharge contained mycelium, but no coloured bodies. The growth extended as far as the angles of the jaw on both the inner and outer aspects, the mouth could only be opened half a centimetre, the tongue and skin were normal, the glands were not enlarged.

An incision was made a little above the lower border of the jaw, and the growth separated from the jaw, which was softened in places where characteristic grains of actinomycosis were found; these spots after curetting were irrigated with iodine solution. Two openings were left for drainage and daily iodine irrigation, 5 grammes (60 grains) of iodide of potassium, were given daily. In six weeks discharge had ceased and general health improved. The article is illustrated by engravings of the case and also of cattle, of which it is said 3 per 1,000 are affected with actinomycosis.

Actinomycosis in South America.

CRANWELL. *Revista de la Sociedad Médica Argentina*, fas. 1, 1904.—Of animals slaughtered in Buenos Ayres, 1 per 1,000 had actinomycosis; the proportion was higher in Monte Video. In Uraguay it is very frequent. In Chili it is often found in cattle and in the lungs of pigs. In Brazil it has occurred in man. A monograph by Lignières and Spitz is referred to, describing an epidemic in cattle of actino-bacillosis, affecting mainly the skin, sometimes only the maxilla; the glands were swollen. The pus contained no filaments, and did not stain by Gram.

Anæmia in Ankylostomiasis.

ALESSANDRINI. *Il Policlinico Sezione Medica*, December.—The procedure was to wash the worm while alive, dry it with filter paper, isolate the cervical gland, tease it into fragments, and with these mix blood from himself and other persons. Under the microscope on a warm stage, near the portions of gland were seen the remains of red corpuscles, at a greater distance there were distended and crenate corpuscles, at the periphery of the field leucocytes and normal red corpuscles. The article contains a description and picture of the cephalic and cervical glands. From observations on the cervical glands of ankylostoma from various animals, the size of the gland varies; in the worms from man and mammals it is about half the length of the body; in ankylostoma from the boa constrictor (*U. boae*) the gland is almost as long as the worm. The size of the gland is proportionate to the vital resistance of the host. The gland secretes a poison which acts on the blood and causes the anæmia. The loss of blood by suction and subsequent oozing only aggravates the disease.

Ankylostomiasis in the Dutch East Indies.

In *Gen. Tijdschr.*, N. I., 44, two views as to treatment are given. One is to treat with thymol all who pass ova, because the early symptoms may escape detection, especially in natives. This lessens the number of patients, and especially the number of worms passed. The other view is that it is unnecessary to treat all who pass eggs, because a small number

of worms do not cause symptoms, and it is dangerous for thymol to be administered by incompetent persons, but in plantations and mines all cases can be treated.

Cancer and Tabes in Brazil.

SODRE. *Revista Medica de S. Paulo*, November 15, 1904.—Cancer is very rare; in certain localities the cases have increased in recent years. The frequency varies with the latitude, being rarest at the Equator. Tabes and general paralysis of the insane are very rare, disseminated sclerosis and chronic myelitis are frequent. The climate influences both diseases, modifying their evolution and the progress of syphilis, which is very common. The diseases are rare because visceral syphilitic manifestations are rare.

Filaria Perstans and Trypanosoma in the Chimpanzee.

In the light of our present knowledge, it is interesting to recall to our readers the fact that in June, 1900, Dr. Hans Ziemann discovered the embryos of a filaria in the blood of one chimpanzee, and trypanosoma in that of another. The investigations were undertaken in the Congo Français, and on repeated examination both day and night, the embryos of the filaria were always found to be similar. Sir Patrick Manson examined the preparations sent to him by Ziemann, and agreed with him that the parasites were morphologically identical with the embryos of *Filaria perstans*. The observation is of great theoretical interest, as hitherto *Filaria perstans* has never been found in any vertebrate animal but man, and Manson, in a letter to the investigator, directs attention to the analogy it presents in regard to the parasites of human malaria. The chimpanzee examined never showed any symptom of disease. In examining another chimpanzee, Ziemann found a few *Trypanosoma* in the blood. They bore a great resemblance to the *Trypanosoma Lewisi*, Kent, illustrated in Döeflin's book on the "Protozoa" (with an enlargement of 1,000), the only difference being that the flagellum was considerably shorter. The undulating membrane was distinctly visible, but unfortunately Ziemann could not obtain permission to again examine this chimpanzee at a later date.—(*Archiv. für Schiffs-und Tropen-Hygiene*, vol. vi. 1902.)

Leprosy.

ROMER. *Janus*, December.—The bacillus is found in scrapings from the apparently normal skin from the lobe of the ear, from nose, tongue, pharynx and larynx, from scrapings of the nails of the hands and feet, in the urethra, under the prepuce, and in the saliva. It is early found in the roots of the hairs of the eyebrows, of the neck and of other hairs, excluding the scalp. As a diagnostic point it is found in sebaceous secretion at the commencement of the disease. The scrapings, hairs, and other tissue are pounded in a mortar with water, this is centrifugalised and stained, enabling the bacilli to be found when by ordinary means their detection is difficult.

Medical Notes in Central Brazil.

MANSFELD. *Muench. med. Wochn.*, No. iii., 1904.—When the expedition lost their salt, notwithstanding the use of ashes from the bones of fish and ashes from vegetables, digestive troubles began after three weeks. When salt was again taken, for the first eight days a small quantity in the food caused violent diarrhœa. Four tribes were met suffering from an epidemic of *catarrhal bronchitis*, introduced by three Europeans infected with influenza. Ranke's account was confirmed of a man from Rosasio with *gonorrhœal ophthalmia* infecting a whole village with the disease.

In ten weeks at Cuyaba in Matto Grosso, many cases of old and recent *malaria* were seen in rubber gatherers, twenty-eight cases of *leprosy*, three cases of *elephantiasis* in Negroes; some cases of a skin disease called bubas, which were diagnosed as *frambœsia*. Some cases were provisionally diagnosed as *beri-beri*. *Intestinal worms* were common, and *acute* and *chronic eczema*.

Snake-bites in Brazil.

BASSEWITZ, in *Muench. med. Wochn.*, No. xix., 1904, gives an account of his method of treatment, which consists in killing the snake, extracting the liver with all possible antiseptic precautions, pounding it in a mortar, adding slowly 50 to 100 cc. of a 7 per cent. chloride of sodium solution, filtering the solution and injecting into the flanks. This soon becomes putrid; antiseptics destroy its action. Its use is only recommended when the serums of Vital Brasil of the Pasteur Institute, S. Paolo, cannot be obtained. One is antitoxic to the bites of botrofi, the other to the bites of crotali; when in doubt, an equal quantity of both is injected. A 1 per cent. solution of permanganate of potash injected is commonly used.

Trypanosomiasis.

GUENTER and WEBER. *Muench. med. Wochn.*, No. xxiv., 1904.—The symptoms were noticed in March, 1902, when a European, aged 33, was in Kamerun, South Africa. There were recurrent irregular rises of temperature with parasites in the blood, hæmoglobin was reduced to 60 per cent., mononuclear leucocytes were increased, fugitive local œdema, exaggerated irritability of the cutaneous vessels (marked dermatographia), painful swelling of one side of the head, followed by loss of hair, a rosy macular eruption, circumscribed and without itching, the liver and spleen were increased. Sometimes there was dyspnœa; the pulse was rapid, even in April, 1904, whilst the patient felt well it varied from 116 to 124.

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EXCHANGES.

Annali di Medicina Navale. Annali d' Igiene Sperimentale Archiv für Schiffs u. Tropen Hygiene. Archives de Medicine Navale. Archives Russes de Pathologie, de Médec. Clinique et de Bacteriologie. Australasian Medical Gazette. Boletin de Medicina Naval. Boston Medical and Surgical Journal. Bristol Medico-Chirurgical Journal. British and Colonial Druggist. British Journal of Dermatology. British Medical Journal. Brooklyn Medical Journal. Caducée. Climate. Clinical Journal. Clinical Review. Giornale Medico del R. Esercito. Hong Kong Telegraph. Il Policlinico. Indian Medical Gazette. Indian Medical Record. Indian Public Health. Interstate Medical Journal. Jahresbericht. Janus. Journal of the Royal Army Medical Corps. Journal of Balneology and Climatology. Journal of Laryngology and Otology. Journal of the American Medical Association. La Grèce Médicale. Lancet. Liverpool Medico-Chirurgical Journal. Medical Brief. Medical Missionary Journal. Medical Record. Medical Review. Merck's Archives. New York Medical Journal. New York Post-Graduate. Pacific Medical Journal. Polyclinic. Public Health. Revista de Medicina Tropical. Revista Medica de S. Paulo. Sei-i-Kwai Medical Journal. The Hospital. The Northumberland and Durham Medical Journal. Transactions of the American Microscopical Society. Treatment. West India Committee Circular.

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Original Communications.

ON THE ETIOLOGY OF AINHUM.

By L. E. Ashley-Emile, L.R.C.P., L.R.C.S.Edin., L.F.P.S.Glas.

Mopra, Zambesi River, East Africa.

Ainhum is usually defined in our text-books as a disease of the toes, usually the little, and characterised by a furrow in the line of the digito-plantar fold; this gradually deepens, the end of the toe enlarges, and usually, without inflammation or pain, the toe falls off.

In reviewing the geographical distribution of this obscure disease, it appears to have spread widely over the African Continent, and is met with particularly on the West Coast, especially among the Negroes of the Krao tribe, who are very prone to it; it also occurs in South Africa, and a few cases have of late been reported from there by Dr. Muir. The disease has been described in Nossi Né, an island on the north-west coast of Madagascar, and sporadic cases have been seen in Réunion, Algiers, Cairo and Suez. Ainhum is not so prevalent in East Africa (Mozambique) as one is apt to suppose. After an examination of some 500 Zambesi natives of mixed tribes working on the sugar estate here, I have met with only three cases in all in members of the Dombé tribe, a brief description of which will be of interest, both from a geographical as well as from an etiological point of view.

Case 1.—K., Zambesi Negro of Dombé tribe, occupation, labourer, 28 years of age, came to the local dispensary for treatment. Patient fairly well developed, has always been in good health. Is unable to state definitely when his present complaint commenced, has noticed it for many years, began as an incomplete circular shallow tightening in of the skin, producing a furrow on the inner and lower aspect of base of right little toe corresponding with the joint; has always been painless, and never prevented him from pursuing his usual avocation until four days ago, when a fissure formed at the constricted part, causing great pain, for which he sought treatment. His brother is also suffering from a similar complaint. Patient does not recollect either of his parents ever having a similar disease. Has no hereditary history of leprosy. He has never had any venereal disease, nor does he remember ever injuring his toe. Has always been going about bare-footed, and has not worn toe rings. He has always lived in these parts.

Present State. — Patient is of medium height, about 5 ft. 5 in., fairly well developed, and otherwise in good health; no signs of arterio-sclerosis can be detected. Temporal arteries not prominent, and radial has no tendency to thickening, and has quite a normal feel. Pulse of normal tension and moderate volume. Has never had syphilis, and there are no evidences of that disease. Skin of body is quite smooth, without marks of any eruption. A careful examination was made for leprosy with a negative result; nerve trunks not thickened, and no patches of any kind perceptible; no change in the motor and sensory functions detected, viz., superficial and deep reflexes elicited and found normal. Muscular sense tactile, pain and temperature impressions intact.

Facial Appearances.—Skin of forehead and eyebrows furrowed, nose broadened out, cheeks heavy, lips and ears thickened, entire countenance looks bloated and greasy.

Examination of Affected Part. — Right little toe reveals the usual characters of the disease: toe bent inwards, and a groove is seen on the inner and lower surface of the base of toe, close to the fold between the toe and sole of foot; dorsum and outer aspect unaffected, distal portion of toe swollen, round in shape, resembling a small potato, nail still attached, small, dry and furrowed, occasional and slight pain at rest, groove and contiguous surfaces tender when touched with a probe. On separating the toes a dry, narrow fissure corresponding to cutaneous groove is apparent, and a probe can be passed into the joint; the fissure presents an ulcerated surface, with a fœtid, purulent discharge; dorsum also ulcerated. Pain severe when toe is moved, in consequence of which patient ties it to the fourth toe in order to obviate the movements of the toe and prevent it from touching the ground. Patient is flat-footed.

Case 2.—J., Zambesi Negro, of Dombé tribe, occupation, labourer, about 30 years of age, and brother to previous case.

Present State.—Patient is otherwise in good health, of strong physique. Has no arterio-sclerosis, nor any symptoms of leprosy or syphilis. Manifests an early stage of the disease, the usual constricting band and groove are present but no fissure, and therefore no pain. Has no inflammation; toe is bent inwards, and at the groove the skin is thickened and indurated; distal portion of phalanx is not swollen and enlarged to any considerable extent. Patient is flat-footed; nail normal, sensory and motor functions intact.

Facial Appearances.—Same as previous case.

Case 3.—R., Zambesi Negro, of Dombé tribe, occupation, labourer, about 40 years of age. Has always been in good health, except for a similar disease which occurred in left foot some years ago. He is unable to state when the present complaint commenced, says it began in the usual manner. No hereditary tendency to leprosy or ainhum can be obtained; has never had syphilis, and shows no traces of that disease. Traumatic and mechanical history negative. Has always been going about bare-footed, and has never worn toe rings, and has always lived in these parts.

Present State.— Patient is of fairly strong physique, about 5 ft. 4 in. in height, and otherwise in good health. Has visible and marked evidences of arterio-sclerosis, temporal arteries prominent, dilated and tortuous, and the radial feels stiff and rigid when rolled beneath the fingers, there is increased and persistent high tension, pulse wave slow in its ascent, enduring and subsiding slowly in the interval, between the beats the vessel remains full, and firm pressure does not obliterate the pulse, which can be felt beyond the point of compression. Left ventricle slightly increased in size, apex-beat is within the nipple line, impulse heaving and forcible, and second aortic sound clear and accentuated. Has never had syphilis, and has no evidences of that disease. Skin

free from all marks of eruptions. Special attention was directed to finding symptoms which might point to leprosy, but without result. Perception of pressure, touch, pain and temperature intact, motor reflexes, both superficial and deep, normal.

Examination of Affected Part: Right Foot.—Little toe presents the usual characters of advanced ainhum, toe bent inwards, a groove extends nearly round the toe, except at its outer part; distal phalanx swollen and rounded in appearance; nail dry and sclerosed. On separating the toes a deep, narrow fissure is disclosed, bounded by indurated skin, fissure ulcerated and emitting an offensive purulent discharge; severe pain elicited on touching the part or moving the toe; sensibility of terminal phalanx not diminished, all other toes normal. *Left Foot:* Shows signs of previous ainhum, second toe missing, as if amputated at the metatarso-phalangeal joint, little toe deformed, twisted inwards and of diminutive size; no symptoms of inflammation or ulceration present.

Facial Appearance. — Same as other two cases. Patient is flat-footed.

Etiology.—Nothing is known as to the true nature of ainhum, and of late little progress has been made towards arriving at any satisfactory conclusion as to its causation, with the result that at the present time ainhum occupies a paramount position in the category of tropical diseases of uncertain nature.

The African race is said to be specially predisposed to this complaint, on account of the natives being flat-footed, and in consequence the flexor tendons of the two small toes have an oblique attachment. Such a direction of the flexor tendons is indeed a strong predisposing cause, yet some other factor must be present, for ainhum would be much more prevalent all over Africa than at present, and not localised to certain parts, such as the West Coast and a sporadic distribution in other localities; besides, natives of all tribes would suffer equally, which is not the case, since on the West Coast the Krao tribe is more prone to it than any other, and in these parts the Dombé tribe.

Sex.—Men are more subject to this disorder than women. Adult males, between 30 and 40 years of age, are most often affected; children are seldom attacked.

Habits.—It has not been met with in those accustomed to boots, or in persons in a favourable condition of life.

Occupation.—Carriers of burdens are most subject to it, owing to the fact that greater strain is applied to the leg muscles in maintaining an erect position.

Exciting Causes.—Several suggestions have from time to time been made, the most important are as follows:—

(1) "That ainhum is a form of scleroderma." There are many objections to this theory, viz., scleroderma affects females more than males; the seats of election are usually the arms and neck and along the course of nerves; besides, the lesion occurs in patches with change of colour in the skin, either areas of pigmentation or of complete atrophy producing leucoderma.

(2) *Mechanical Theory.*—"That ainhum is produced by ligature or the wearing of toe rings." The previous history and the habits of the nations disprove any such suggestion.

(3) *Traumatic Theory.*—"That it is produced by wounds inflicted on bare feet in walking through grass or jungle." It is difficult to understand why the little toe should invariably be wounded, which, owing to its situation and size, is more protected than the other toes; besides, the body weight during locomotion is felt with greater force by the three inner toes, which are, in consequence, subjected to greater pressure and are, therefore, more likely to meet with injurious results from any obstacle than the little toe.

(4) Finally, the much-debated theory "whether ainhum is a manifestation of leprosy" has not met with general acceptance, notwithstanding the repeated statements of Zambaco Pascha, the specialist in leprosy. His weighty opinion, however, cannot be lightly negatived until we are in possession of more conclusive proofs as to the contrary. Personally I am inclined to attach much importance to this suggestion and to regard ainhum as a modified form of that disease, occurring in persons not the subject of leprosy (since leprosy and ainhum have not been seen in the same person) but in persons of a "leprous diathesis." In a vast country like Africa, where leprosy is universal, lepers, particularly in the Tropics, enjoy the same liberty as the remainder of the population; they mix freely with healthy persons, and are in no way debarred from entering into social contracts. It is quite probable the resulting offspring of such unions may develop the disease in a mild form should one of the parents be healthy, and in the succeeding generations no such manifestation may occur. Though the descendants of the latter be, to all outward appearances, free from any of the suspicious signs and symptoms of the original disease, they have in consequence inherited an unhealthy nerve influence, which fact, taken in conjunction with the various etiological factors, is of great importance in the production of ainhum. I am inclined to believe the condition is caused as follows: In the carrying of heavy burdens the leg muscles are subjected to great strain, the injurious effect of which is most felt by the flexor tendon of little toe, owing to its oblique attachment, which, in consequence, is compelled to act at a great disadvantage; the enfeebled nerve supply from over stimulation undergoes slow atrophy of its fibres, leading to fibroid degeneration at the seat of muscular attachment round the joint. On contracting the tightening in and puckering of the skin is produced, with inward rotation of the toe. Strangulation of the vessels follows as a natural result, first the arteries, the large veins of the hypodermis, cutis and venous capillaries become dilated and a potato-like prominence of the distal phalanx, so characteristic of the disease, takes place.

Remarks.—In the above cases this particular leprous diathesis which I have endeavoured to describe was well manifested in the facial appearances, and the close family relationship in the first two cases affords strong presumptive evidence as to the antecedent disease, viz., leprosy and its transmissibility in a modified form, which we now recognise under the appellation of ainhum.

Business Notices.

1.—The address of the JOURNAL OF TROPICAL MEDICINE is Messrs. BALE, SONS & DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All **literary communications** should be addressed **to the Editors.**

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7.—The Journal will be issued on the first and fifteenth day of every month.

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Contributors of Original Articles will be supplied FREE with six copies of the Journal if a request accompany the MS. If reprints are required they will be supplied by the publishers, if the order is given with remittance when sending the MS. The price will be as below:—

50	Copies of four pages,		5/-;
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THE

Journal of Tropical Medicine

FEBRUARY 1, 1905.

THE COLONIAL MEDICAL REPORTS.

WITH this issue of the Journal we publish *Selections from the Colonial Medical Reports* of 1902-1903. From time to time we have given extensive abstracts of these valuable reports ever since the Journal first appeared; but it is our intention to systematise the publications. In the centre of each Journal will be found four to eight pages devoted to these selections, separately numbered and issued, so that if it is desired to bind them separately at the end of the year, it may be done conveniently and readily.

We have long felt that the elaborate medical reports carefully prepared by competent medical men holding high and responsible positions in the Colonial Medical Service should be made much more widely known than they hitherto have been. Blue books and Government reports are too often looked upon as merely furniture for libraries, or at most but stores of knowledge referred to by statisticians or compilers of figures. No one, however, who has looked into these reports, or who has studied even casually the excellent "selections" which have been hitherto issued by the Colonial Medical Department, can have failed to appreciate the enormous amount of valuable clinical, pathological, meteorological and hygienic information contained in them. From every quarter of the globe they come, each one with its special interest. The epidemiologist will find in them a prolific storehouse of knowledge to hand. It will be brought home to him that diseases prevalent in one district are unknown in another. Here filaria prevails, there malaria exists, the one perhaps to the exclusion of the other; here plague is epidemic, there in a neighbouring district the disease claims only a few victims. Diseases hitherto unknown in a district become prevalent for the first time. The pathologist will observe that the types of disease vary in different districts; that parasites which are important etiological factors in one place are less potent for evil in another; that different intestinal parasites affect different countries to an extent which appears inexplicable, but which admits of solution if the whole circumstances and environment are considered. The ill-assorted and unscientific findings of insurance agencies by a perusal of the *Colonial Medical Reports* could be corrected and brought into a form suitable to existing conditions; and not in accordance with the gossip of travellers and ship captains dating from a period of many decades ago, when hygiene, both at home and in the Tropics, was an unknown quantity.

By the courtesy of the Colonial Office authorities we are permitted to publish these selections, and as time goes on the form in which they are issued will no doubt admit of considerable improvement. Meantime we beg our readers to communicate with us in regard to the manner and form in which the "selections" are published, and to help us to perfect what is an attempt to place the medical literature emanating from the colonies of the Empire upon a basis worthy of the importance attaching thereto.

PLAGUE IN INDIA.

DURING the week ending December 31st, 1904, 22,645 persons died from plague in India. Compared with the corresponding periods in 1902 and 1903, when the deaths were 14,000 and 17,000 respectively, 1904 shows a marked increase in mortality from plague. For a number of years the Bombay Presidency showed the maximum mortality; in the winter of 1903-1904, the Punjab held the record; and now in 1904-1905, during what may be termed the plague epidemic season in India, it is in the United Provinces (North-west Provinces and Oudh) that the mortality is highest.

Experience of plague in India during the past nine years shows that the disease appears first as an outbreak which, after prevailing for a year or two with a gradually increasing mortality, rather suddenly develops into a severe epidemic, and then lingers in an endemic form with varying intensity for many years.

Bombay, the Punjab and the United Provinces have each in turn had their "grand attack," and if the rule is to hold good in other districts of India the future is not without anxiety in Madras, Mysore, Bengal, the Central Provinces, and wherever else plague has appeared. It must be confessed plague is a disease which, when allowed to get hold upon a community, is beyond the control of any remedial sanitary measures at present known to us. The disease has prevailed in India ever since 1896, has caused the deaths of several millions of people, and the last year of its prevalence is the worst on record.

Plague has defied the efforts of the Government of India to check its spread or to limit its virulence, and it would appear as though the disease must work out its own immunity. In another ten or fifteen years it is possible plague may disappear as an epidemic by self-immunisation, and may then linger on indefinitely in a less severe form for many decades. It is not a hopeful or comforting outlook, but it is one which, while lamenting, we see no reasonable chance of bettering.

It is useless to suggest that a special and separate organised body of sanitary officers should be appointed to deal with plague in India; for those who know official life in India know well that such an attempt would be looked at askance.

MARRIAGE LAWS AND INSANITY IN CHINA.

INSANITY is an affliction comparatively rarely met with in China. In this connection the marriage laws and some of the customs prevalent amongst the Chinese are well worthy of study. No Chinaman is allowed to marry into a family possessing the same surname as himself, so that consanguinity of parentage is impossible. In China the surname is placed first in the signature, so that a person of the name of Ng-Ting-Foo belongs to the Ng family, and it is forbidden for a man of that name to marry into any Ng family, however parentally distinct, and however impossible it may be to trace even a remote connection between the families, as all persons possessing the same surname are regarded as brothers, sisters, or cousins. Consanguinity in marriage is therefore rendered well-nigh an impossible contingency in China, and all the more certainly as the parents arrange the marriage, selecting the bride for the bridegroom, so that love-match transgressions are practically impossible.

In this matter the Chinese, as in many other phases of public health, set an example which might well be followed. In Europe and America it is too often the endeavour of parents "to keep the money in the family," and they favour marriages between cousins to accomplish their ends. The selection of wives for their sons by parents wisely, that is hygienically, conducted would tend towards improving the public health in many ways, for no wise parents wish to see their offspring united in an unhealthy marriage. In China the youthful age at which marriage is encouraged favours this *régime* in a manner which would be resented by men and women at the more mature years at which they marry in Europe; but that does not in any way justify the proceeding from a hygienic standpoint. There may be much against early marriages, but the virility of the Chinese does not appear to be lessened by it, and there is less danger of children being born with hereditary taints either from alcohol or syphilis than in countries where marriage is deferred until the man is between the ages of 30 and 40.

Intoxicating liquor is rarely consumed in China, and by young men practically never. Opium smoking has been shown in Java, and by Dr. Ellis in Singapore, where the population is Chinese and opium smoking is wide-spread, to have no etiological bearing upon insanity. General paralysis of the insane and other brain lesions were not found in a single case of 370 insane natives examined in Singapore, whilst there were eight such cases amongst fifty European insane. These facts accord with experience in other countries and give food for thought in several directions.

J. C.

LONDON SCHOOL OF TROPICAL MEDICINE.

Mr. W. S. Perrin has been appointed to the Chair of Protozoology, and Robert Thomson Leiper, M.B., B.Ch., Glasgow, has been appointed to the Chair of Helminthology at the London School of Tropical Medicine. Mr. Perrin was a scholar of Gonville and Caius College, Cambridge, and obtained a first class in both parts of the Natural Science Tripos. He holds the Shuttleworth Research Scholarship of his College.

Mr. Perrin devoted his energies to protozoological work in Cambridge, and with a view of extending his knowledge, he proceeded to Rovigno to study parasitic protozoa under Professor von Prowazek, assistant to Professor Schaudinn at the Marine Zoological Station near Trieste.

Dr. Leiper gave early manifestation of his interest in zoology, and particularly in parasitic helminthology, and for some time he has been wholly engaged in the pursuit of that study. At the meeting of the British Association in Belfast he contributed a paper on a new parasitic worm, found in *Echinocardium cordatum* (Penn.). The Zoological Society of London in their *Proceedings* for 1904 published a descriptive account by Dr. Leiper of *Avagina incola*, with a note on the classification of the *Proporidæ*. He also described a new sporozoon parasite from the skin of *Rossia macrosoma* at a meeting of the Medical Chirurgical Society in Glasgow in 1904. Recently he has been engaged in the examination of the helminthological material brought to this country by the Scottish National Antarctic Expedition. The Senate of the University of Glasgow in 1902 elected Dr. Leiper Research Scholar in the Embryological Department; he also held a Carnegie Medical Research Scholarship.

BANQUET ON BEHALF OF THE LONDON SCHOOL OF TROPICAL MEDICINE, ON MAY 10, 1905.

The Right Honourable Joseph Chamberlain, M.P., in the Chair.

The following letter is being circulated:—

Sunderland House,
Curzon Street,
London,
January 23, 1905.

Dear Sir,—I have accepted the Chairmanship of the Dinner Committee which is to arrange the banquet over which Mr. Chamberlain will preside at the Hotel Cecil, on May 10th, on behalf of the London School of Tropical Medicine. I write to ask you if you will be good enough to allow your name to appear as a steward, and, furthermore, to express the hope that you will use your kind interest with your friends and others to enable us to announce as large a sum as possible at the banquet.

The School owes its inception to Mr. Chamberlain and has received the active sympathy and support of the present Secretary of State for the Colonies. The success of this far-reaching attempt to ameliorate the condition of our fellow countrymen in the Tropics and to save from sickness and suffering, not only those who are carrying on the work of the Empire in dangerous climates, but also the native inhabitants, has far exceeded the anticipation of its founders. In recognition of what has been done, and of the wide field of work that remains to be covered, Mr. Chamberlain has consented to preside at the banquet in order to call public attention once again to the movement and, if possible, to place the School upon a sound financial basis.

The School, which was originally intended for twelve students, has expanded, until now it has accommodation for forty students. This number is at present working in the laboratories and there is every prospect of a further increase.

The Seamen's Hospital Society has kindly advanced the greater part of the funds expended on the building and equipping of the School, which is now indebted to that Charity to the extent of £6,000 or £8,000. It is partly to defray this debt that the banquet is to be held, but also, and in addition, to raise a very much larger capital sum so as to place the finances of this valuable Institution upon a permanent footing and adequately to endow the double work of teaching and research.

When it is borne in mind that there are three sessions in each calendar year, it will be readily appreciated that the School, training as it does, with its present limited resources, over 100 students annually, cannot fail in the course of a very few years to effect a marked and lasting improvement in the treatment of tropical diseases and to widen the knowledge of their causes and remedies.

The enclosed papers[1] will give you further particulars, and it will afford me much pleasure to send you any information you may desire in reference to the School and Hospitals and in regard to the arrangements which are being made for the banquet.

I trust that I may count upon your assistance in this important matter.

Believe me,
Yours sincerely,
Marlborough,
Chairman of Dinner Committee.

Contributions may be sent to the bankers of the Seamen's Hospital Society, Messrs. Williams Deacon's Bank, Ltd., 20, Birchin Lane, London, E.C.

The *Indian Medical Gazette*, by its January number, inaugurates the fortieth year of its existence. We wish this important and excellent periodical continued success.

[1] The papers referred to give an account of the work of the School since its opening five years ago.

British Medical Association.

MEETING AT LEICESTER.

July 24 *to* 28, 1905.

PROGRAMME.

President: William Collier, M.D., F.R.C.P.Lond., Physician, Radcliffe Infirmary, Oxford, and Litchfield Lecturer in Medicine, University of Oxford.

President-elect: George C. Franklin, F.R.C.S., Honorary Surgeon, Leicester Infirmary.

Chairman of Representative Meetings: Sir Victor Horsley, F.R.S.

Chairman of Council: Andrew Clark, D.Sc., F.R.C.S.

Treasurer: Edward Markham Skerritt, M.D., F.R.C.P.

An Address in Medicine will be delivered by Henry Maudsley, LL.D., M.D., F.R.C.P.

An Address in Surgery will be delivered by Charles John Bond, F.R.C.S.

A popular lecture will be delivered by Professor William Stirling, D.Sc., M.D., F.R.S.E.

SECTIONS.

The annual meeting at Leicester will comprise twelve Sections as shown in the subjoined list. The Sections will meet on Wednesday, Thursday, and Friday, July 26th, 27th and 28th, from 10 a.m. to 1 p.m.

The President, Vice-Presidents, and Secretaries of each Section constitute a Committee of Reference for that Section.

Papers read are the property of the British Medical Association, and cannot be published elsewhere than in the "British Medical Journal" without special permission.

No paper must exceed fifteen minutes in reading, and no subsequent speech ten minutes.

Medicine.

President: Frank M. Pope, M.D., F.R.C.P., Leicester. *Vice-Presidents:* Reginald Pratt, M.D., M.R.C.P., Leicester; Robert William Philip, M.D., F.R.C.P.Edin., Edinburgh; William Bramwell Ransom, M.D., F.R.C.P., Nottingham. *Honorary Secretaries:* William Mitchell Stevens, M.D., M.R.C.P., 21, St. Andrew's Crescent, Cardiff; Frank Harwood Jacob, M.D., 28, Regent Street, Nottingham; Bertrand Dawson, M.D., 32, Wimpole Street, Cavendish Square, W.

Surgery.

President: Sir Charles Bent Ball, M.D., F.R.C.S., Dublin. *Vice-Presidents:* Claude Douglas, F.R.C.S., Leicester; Henry John Blakesley, F.R.C.S., Leicester; James Henderson Nicoll, M.B., C.M., Glasgow. *Honorary Secretaries:* Percy Furnivall, F.R.C.S., 28, Weymouth Street, W.; Cecil Edward Marriott, M.S., 5, Welford Road, Leicester.

State Medicine.

President: Philip Boobbyer, M.D., Nottingham. *Vice-Presidents:* Ninian McIntire Falkiner, M.D., Dublin; John Herbert Hawkins Manley, M.D., D.P.H., West Bromwich; Thomas Robinson, M.R.C.S., D.P.H., Leicester. *Honorary Secretaries:* Wm. Williams, M.D., D.P.H., County Health Department, 9, the Parade, Cardiff; Chas. Killick Millard, M.D., D.Sc., Town Hall, Leicester.

Industrial Hygiene and Diseases of Occupation.

President: Hy. Wm. Langley Browne, M.D., West Bromwich. *Vice-Presidents:* Alexander Campbell, M.D., Dundee; John Colley Smyth Burkitt, M.D., D.P.H., Leicester; Thomas Morrison Legge, M.D., London. *Honorary Secretaries:* Clement Frederick Bryan, M.R.C.S., 44, Humberstone Road, Leicester; Thomas Watts, M.D., 34, Church Street, Hyde.

Laryngology, Otology and Rhinology.

President: Frederick William Bennett, M.D., Leicester. *Vice-Presidents:* William Arthur Carline, M.D., Lincoln; John Middlemass Hunt, M.B., Liverpool. *Honorary Secretaries:* Alex. Lewis MacLeod, M.B., 89, Hinckley Road, Leicester; Chas. Herbert Fagge, M.S., F.R.C.S., 22, St. Thomas's Street, London Bridge, S.E.

Navy, Army and Ambulance.

President: Surgeon-Lieutenant-Colonel Henry Walter Kiallmark, M.R.C.S., London. *Vice-Presidents:* Surgeon-Lieutenant-Colonel Robert Bradshaw Smith, V.D., L.R.C.P., Hinckley; Lieutenant-Colonel Edmond Monkhouse Wilson, C.B., C.M.G., D.S.O., S. Farnboro'; Fleet-Surgeon Alexander J. J. Johnston, R.N., Haslar. *Honorary Secretaries:* Surgeon-Captain Wm. Pemberton Peake, M.R.C.S., 21, Oxford Street, Leicester; Captain Edwin Charles Montgomery-Smith, R.A.M.C. (Vol.), 36, Abbey Road, St. John's Wood, N.W.

Obstetrics and Gynæcology.

President: Herbert Ritchie Spencer, M.D., F.R.C.P. London. *Vice-Presidents:* Henry Meadows, M.B., Leicester; Professor Henry Corby, M.D., Cork; Francis Richard Cassidi, M.D., Derby. *Honorary Secretaries:* Montague Wm. Williams, M.R.C.S., 45, London Road, Leicester; Miss Louisa Garrett Anderson, M.D., 4, Upper Berkeley Street, W.

Ophthalmology.

President George Andreas Berry, F.R.C.S.Edin. *Vice-Presidents:* Wm. Mardon Beaumont, M.R.C.S., Bath; Edwin Collier Green, M.R.C.S., Derby. *Honorary Secretaries:* Robt. Wallace Wesley Henry, M.D., 6, Market Street, Leicester; John Herbert Parsons, F.R.C.S., 18, Stratford Place, W.

Psychological Medicine.

President: Alexander Reid Urquhart, M.D., Perth. *Vice-Presidents:* Rothsay Charles Stewart, M.R.C.S., Leicester; Theophilus Bulkeley Hyslop, M.D., London. *Honorary Secretaries:* Arthur Molyneux Jackson, M.B., Nottingham County Asylum, Radcliffe-on-Trent; John Wigmore Higginson, M.R.C.S., Hayes Park Asylum, Hayes.

Pathology.

President: Frederick Walker Mott, M.D., F.R.C.P., F.R.S., London. *Vice-Presidents:* Theodore Shennan, M.D., Edinburgh; Professor Arthur Hamilton White, L.R.C.P.I., Dublin. *Honorary Secretaries:* John William H. Eyre, M.D., Guy's Hospital, S.E.; Thomas Villiers Crosby, M.D., 91, St. Peter's Road, Leicester.

DENTAL SURGERY.

President: Morton Alfred Smale, M.R.C.S., L.D.S., London. *Vice-Presidents:* Edward Lloyd-Williams, M.R.C.S., L.R.C.P., L.D.S., London; Francis John Lankester, M.R.C.S., L.D.S., Leicester. *Honorary Secretaries:* Wm. Armstrong Vice, M.B., L.D.S., 19, Belvoir Street, Leicester; Joseph George Turner, F.R.C.S., L.D.S., 12, George Street, Hanover Square, W.

TROPICAL DISEASES.

President: Rubert Wm. Boyce, M.B., F.R.S., Liverpool. *Vice-Presidents:* Andrew Duncan, M.D., London; Fleming Mant Sandwith, M.D., London. *Honorary Secretaries:* George Aylwin Clarkson, F.R.C.S., 11, Southgates, Leicester; John M. Hendrie Macleod, M.D., 11, Harley Street, London, W.

The Honorary Local Secretary is—
ASTLEY V. CLARKE, M.D.
37, *London Road, Leicester.*

PLAGUE IN INDIA, JULY 1 TO DECEMBER 31, 1904.

IN the Journal of September 1st, 1904, the detailed statement of the deaths from plague in India from January 1st to June 31st, 1904, was published. The deaths during the six months numbered 725,631.

The weekly death-rate from plague in India during the six months ending December 31st, 1904, were as follows:—

July	1—2	700
,,	9	1,910
,,	16	1,995
,,	23	2,608
,,	30	3,258
August	6	4,794
,,	13	5,849
,,	20	6,198
,,	27	8,304
September	3	9,914
,,	10	11,191
,,	17	10,671
,,	24	11,866
October	1	13,633
,,	8	16,491
,,	15	16,111
,,	22	13,871
,,	29	15,994
November	5	14,397
,,	12	15,197
,,	19	14,115
,,	26	14,528
December	3	17,728
,,	10	17,439
,,	17	18,284
,,	24	19,465
,,	31	22,645
Total for six months ending Dec. 31st		309,156
Total for six months ending June 30th		725,631
Total deaths from plague during 1904		1,034,787

Abstract.

ON THE EPIDEMIOLOGY OF PLAGUE.

By E. H. HANKIN, M.A.

Chemical Examiner and Bacteriologist to the United Provinces and to the Central Provinces, India.

IN areas in which plague is present, or has recently been present, in India, as an epidemic, no definite relation has been observed between intensity of plague (apart from its persistence) and badness of sanitary condition of dwellings. On the other hand, in areas in which plague is present endemically, so far as evidence goes, very unsatisfactory sanitary conditions exist. Such areas are generally situated in mountainous countries (Garhwal, Yunnan, Beni-Cheir, Transbaikalia). The inhabitants of such places, owing to the difficulty of obtaining water for domestic purposes, are apt to be filthy both in their houses and persons. In Garhwal, Yunnan and Beni-Cheir domesticated animals are stabled in the houses, the paucity of level area making separate provision for cattle a matter of difficulty. Stable refuse consequently is liable to accumulate in the lower floors of the houses, producing conditions favourable to the presence of swarms of fleas.

PERSISTENCE OF PLAGUE IN ENDEMIC AREAS.

A study of the plague in the Indian endemic area of Garhwal indicates that it does not persist there owing to a constant succession of cases of the disease. On the contrary, the disease remains apparently extinct for years, and then suddenly breaks out in fully virulent form. The observations of Planck leave little room for doubt that during the intervals between successive outbreaks the microbe does not continue to exist owing to a succession of passages either through human beings or through rats. Judging from present evidence, it would appear that it exists in a latent state so far as these particular living beings are concerned.

FAKIRS AND PLAGUE.

There seems every reason to associate the wanderings of the fakirs from endemic centres of plague, as in Garhwal and Kumaon, with the spread of plague. The fakirs themselves need not be infected by plague, for it would appear that plague is often caused by persons not themselves infected by the disease.

The outbreak of plague which occurred in Bombay in 1896 was probably derived from infection from Garhwal, and not from Hong Kong as at one time surmised.

PECULIARITIES OF PLAGUE IN BOMBAY.

Plague in Bombay is characterised by its (1) persistency; (2) intensity; (3) by its maximum virulence occurring in villages rather than in towns; (4) by the fact that plague, although it spreads with facility from a town or village to a neighbouring village, does not appear often to be carried to great distances in epidemic form; (5) in India plague shows no tendency to proceed along trade routes as such.

PLAGUE INFECTION NOT A SIMPLE PROCESS.

The spread of plague is not a simple process, for, as pointed out by Simond ("*La propagation de la*

Peste," *Annales de l'Institut Pasteur*, October 1898, p. 625), the infection brought into a village frequently does not manifest its activity until a period of weeks, or even months, after the initial cases have occurred. This fact would appear to indicate that, as a rule, plague spreads not by simple contagion from patient to patient, but by some deep-seated, and perhaps complicated, method.

"Pestis Puerorum."

Hankin draws special attention to the fact that some outbreaks of plague have, according to old and authentic records, chiefly attacked children; so much so, that the disease has been termed "Pestis Puerorum."

Rats and Plague.

The part played by rats in the spread of plague appears to be indefinite, and may be quite unrecognisable. The disease has been known to spread without rats being attacked; men and rats have at times been attacked simultaneously; and again, rats may die of plague without men in the locality contracting plague at all. Hankin regards plague as belonging possibly to the group of miasmatico-contagious diseases, of which cholera and enteric are types. Although the dejecta of human beings frequently contains plague bacilli, there is no direct proof that the dejecta of human beings are an important source of infection. The migration of rats would in some instances explain the spread of plague, but in other cases it would seem that the two are not connected. One fact is clear, however, that there is no quantitative relation between rat and human mortality, for in localities in which dead rats were in great numbers, plague does attack human beings more pronouncedly than in districts where but few dead rats obtained.

Plague would seem to attach itself to a locality, and this cannot be accounted for by contagion arising from the dejecta of either men or rats.

The part played by rat-fleas is fully gone into by Hankin. He is of opinion that biting insects do not directly innoculate man, but by a series of experiments he has arrived at the conclusion that in the rat the bacilli of plague go through a latent period, during which time reproduction is manifest, as evidence of the plague bacillus within the body of fleas. Hankin writes as follows:—

"As evidence that the plague microbe develops within the body of the flea, I can only quote the following observation of my own, made during the above-mentioned plague outbreak in Agra. In April, 1901, a rat was brought to me that had been found dead in the grain dealers' quarter in Agra, shortly after the first human case of the disease had occurred. No trace of the plague microbe could be found, either by microscopical examination or by culture in any of the tissues of the rat. On the rat, however, I found a living flea. This I caught and placed in a tube of sterile bouillon. The tube was violently shaken. The flea was then taken out and placed in a second tube of bouillon and similarly treated. The process was repeated several times, with the object of removing, as far as possible, saprophytic bacteria that might be present on the surface of the flea. After the above treatment the flea was dissected, with strict aseptic precautions, under a dissecting microscope. The stomach was taken out and cut in two pieces. One half was placed on agar-agar, and from it a pure culture of plague was obtained (as shown by involution forms on salt agar, &c). The other half of the stomach was subjected to microscopic examination. The only microbes visible were bacilli with rounded ends, identical in appearance with those of plague. These were arranged in clusters of about a dozen individuals each, and appeared to be embedded in the tissues of the stomach wall. No bacilli were observed in the liquid contents of the stomach. The arrangement of the bacilli in clusters obviously suggests that they were engaged in reproduction *in situ*.—*Journal of Hygiene*, January, 1905.

Books and Pamphlets Received and Noted.

Protective Inoculation against Asiatic Cholera. By Richard P. Strong, M.D. Manila, 1904.

The epidemic of Asiatic cholera which prevailed in the Philippines during 1902-3 was closely investigated as to its epidemiology, pathology and prophylaxis. In the city of Manila food was considered the more probable medium of infection, whilst in other parts of the Philippines the disease was certainly conveyed and spread by the water supply. Dr. Strong reviews the methods of protective inoculation previously employed. They are:—

(1) Ferran, in 1885, during an epidemic of cholera in Spain, first introduced the vaccination of human beings against the disease. The results were unfavourable.

(2) Haffkine's method of vaccination was as follows: An attenuated virus was first prepared by growing the cholera organism in flasks of bouillon at 39° C. while allowing a constant current of air to pass over the surface of the media. After this attenuation the germs were grown upon agar and carried from tube to tube. A virulent virus was prepared by inoculating a guinea-pig intraperitonally with cholera spirilla and then inoculating a second pig with the peritoneal exudate of the first, and so on through numerous animals until a very virulent culture was obtained. This was known as the fixed virus. The vaccination of human beings was performed in two stages. In the first 0·1 to 0·05 of a twenty-four hours' agar tube of the attenuated culture suspended in bouillon was injected subcutaneously. In the second, performed from three to eight days after the first, the same amount of the virulent culture or "fixed virus" was inoculated.

(3) Tamancheff showed that the addition of carbolic acid in the proportion of 0·5 per cent. killed the organisms without, however, interfering with their immunising properties.

(4) Klemperer, in 1892, and afterwards Kolle, determined accurately that specific protective substances enter into the serum of human beings inoculated subcutaneously with cholera organisms. Kolle maintained that a single injection of the living cholera vibrios gave as good an immunity as when the inoculation was repeated, and further, that the use of dead

cultures produced about the same results as that of living ones.

(5) Klemperer, in 1892, sought to obtain immunity in man and animals by the subcutaneous injection of the milk of goats which were immunised with the cholera organisms.

(6) Sawtschenko and Sabolotny, following Klemperer's example, performed feeding experiments upon themselves and their laboratory assistants. They used agar cultures in which the organisms were killed by successive heatings at 60° C. to 70° C.

Sabolotny ingested 2·318 grams and Sawtschenko 1·758 grams of the dead bacteria. Then, in order to prove themselves immune to cholera infection, a few days after the last dose of the killed organisms, they neutralised their gastric juice with 100 cubic centimetres of a 1 per cent. soda solution, and a little later ingested 0·1 cubic centimetre of a twenty-four hours' bouillon culture of the living cholera spirilla. No symptoms followed, although it was stated that cholera organisms were isolated from the stools in each case.

(7) Brieger and Wassermann, in 1892, prepared a virus by growing the cholera spirillum in bouillon prepared with the thymus glands of calves.

(8) In 1893 Wassermann prepared an extract of the organism in the following manner: One thousand cubic centimetres of a three to five days' cholera bouillon culture were evaporated at 70° C. to 80° C. to a syrupy consistency. The residue was treated with absolute alcohol and the heavy precipitate then filtered off and dried over sulphuric acid.

(9) Klebs, after sterilising cultures of the organism, filtered and concentrated them on a water-bath. By precipitation with absolute alcohol the toxic substances were said to be separated out. These were then filtered and the filtrate used for experiments on immunisation. Klebs called the preparation "anticholerin," and demonstrated its protective effect upon guinea-pigs.

(10) Rosmainski, in 1894, precipitated sterilised cultures with acetate of lead, removed the lead with oxalic acid, concentrated the filtrate, again precipitated with milk of lime, and finally sterilised the filtrate. This fluid was said to contain protective substances.

(11) Recently the Swiss Serum and Vaccine Institute of Berne has prepared a prophylactic against cholera obtained from the organism by the method which Lustig and Galeotti described for the preparation of their plague prophylactic.

(12) In 1894 Issaeff worked along the line of inducing immunity by increasing the natural resistance of the individual. He found that different substances, such as tuberculin, nucleic acid, blood serum, bouillon, urine, and even physiologic salt solution, when injected intraperitoneally into animals, caused a transitory protection against infection with cholera spirilla. All of these substances possessed in common the faculty of calling forth either a local phagocytosis in the peritoneal cavity or a general leucocytosis; the resistance declined as the number of leucocytes returned to normal.

(13) Buchner and Hahn sought to obtain immunising substances from bacterial cells by special mechanical means. These authors triturated masses of the moist cholera bacteria mixed with infusorial earth and fine quartz sand. The organisms were subsequently subjected to a pressure of from four to five hundred atmospheres.

(14) Emerich and Loew showed that many bacteria, not only in the animal body but also in cultures, secrete enzymes, which in sufficient concentration are able to dissolve the organism producing them.

(15) Behring and Ransom, as well as Metchnikoff, Roux and Taurelli-Salimbeni, showed the possibility of producing a soluble poison from a highly virulent cholera culture. Behring and Ransom obtained a toxin by the filtration of cultures. Metchnikoff and Roux found that by growing the organism in collodion sacs in the abdominal cavity of guinea-pigs and afterwards upon a special medium containing gelatin mixed with serum a soluble toxin had been produced, which killed guinea-pigs when administered subcutaneously in amounts of one-third cubic centimetre per 100 grams weight.

(16) Finally, Besredka performed experiments upon animals and a single inoculation upon himself with cultures treated in the following manner: The organisms were grown upon agar for twenty-four hours and suspended in normal saline solution, after which enough immune serum was added to cause complete agglutination. The mixture was allowed to stand for twelve hours, during which time the amboceptors and uniceptors of the serum became fixed to the bacteria. The clear fluid was then poured off and the agglutinated organisms freed from the excess of serum containing unbound amboceptors by repeated washings with normal saline solution. The residue, consisting of organisms plus the immune bodies, was heated to 56° C. for one hour and then injected subcutaneously. Of the methods which have been employed, those of Haffkine and Kolle promise the best results.

Description of the Cultures Employed by Strong.

In my search for a practical vaccine, I first studied the local reaction and other toxic effects produced in animals after the injection both of a very virulent cholera culture and of one which, through cultivation on artificial media for a long period of time, had lost most of its virulence. The effects of the killed as well as of the living organisms were also studied with each culture. These two stems, for the sake of brevity, will be referred to in this article as "virulent" and "avirulent."

The avirulent organism was obtained through the kindness of Professor Wassermann. It had been isolated by R. Pfeiffer in the epidemic of cholera which occurred in Hamburg in 1894, and for nine years was preserved on artificial media in the laboratory and from time to time passed through animals. During the past year, however, the strain employed in these experiments had only been grown on artificial media and not inoculated into animals, but there is no doubt whatever of its representing a true though attenuated type of *Spirillum cholera asiaticæ*.

The virulent organism was isolated by Professor Kolle in Jaffa during the recent epidemic of cholera in that place. It reacted in all media in a perfectly typical way, and its morphology and motility were

also characteristic of the genuine cholera organism. It is agglutinated in high dilutions by the same cholera-immune serum, though not in so great ones as the avirulent strain.

The Cholera Toxin.

Since the publication of the first article of R. Koch, in which it was held that the cholera paroxysm, and especially the algid state, was to be regarded as a specific intoxication, due to the absorption from the intestine of the metabolic products of the cholera organism, many authors have attempted to produce experimental proof of the existence and to isolate this specific toxin; but in spite of careful work by Hueppe, Pfeiffer, Metchnikoff, Roux and many others, it is apparent that as yet no substantial evidence has been brought forth to show that the cholera spirillum produces, as do the diphtheria and the tetanus bacilli, a powerful soluble toxin. Even in fresh cholera bouillon and peptone cultures (two or three days old) there are found numbers of dead bacteria, from which, through plasmolysis and digestion, the intracellular toxins are set free. The most reliable evidence points to the conclusion that this toxin exists as an integral part of the bacterial cell.

The Ferments of the Organism.

The cholera vibrio, under certain conditions, produces at least four of these enzymes.

(1) Bitter found that it developes an acid in nutrient solutions containing starch paste.

(2) Fermi and Montesano succeeded in demonstrating that the cholera vibrio, in either sugar or proteid-free media, sometimes, though very inconstantly, produces inverting ferments.

(3) The cholera spirillum has been shown by Schoffer to produce a rennet-like ferment, which is similar in its action to the rennin of the cow's stomach.

(4) A peptonising ferment is, however, the most important.

Preparation of the Prophylactic.

After a consideration of the data given above and acting upon the supposition (1) that the cholera toxin exists as an integral part of the bacterial cell, and (2) that it is set free after the death of the organism and probably partly through the action of its own proteolytic enzyme, which is not destroyed at 60° C., I determined to find out whether the other immunising substances (agglutinin and bacteriolysin) as well as the toxin could not be separated from the bodies of the bacteria by a process of autolytic digestion.

Accordingly cholera spirilla from stems known to possess good peptonising powers were placed in an aqueous solution, carefully killed by heating and digested at 37° C. It was then found that the cholera receptors were set free in the fluid in great abundance, a fact which after filtration was easily demonstrable, since such filtrates possessed the power of binding uni- and ambo-ceptors (agglutinins and bacteriolysins) in a cholera-immune serum, as well as the ability, after injection into rabbits, of giving rise to the appearance of toxic symptoms, and in the case of the ultimate recovery of the animal, to the entrance of antitoxic, bactericidal, and agglutinative substances in the blood serum. Therefore, a filtrate prepared in this manner immediately recommended itself for trial as a prophylactic.

It was prepared in large quantities after the following manner: The surfaces of large flat-sided flasks (after the pattern of Kolle), filled with agar, were sprayed with twenty hours' bouillon cultures of the organism, and the flasks were then put aside for twenty hours in the incubator at 37° C. After this period the growth was suspended in sterile water, removed from the surface of the agar, and the suspension then placed in a sterile flask at 60° C. for from one to twenty-four hours. The mixture was afterwards put aside in the incubator at 37° C. for from two to five days, and finally filtered through a Reichel candle.

In certain experiments the milky fluid overlying the sediment of the bacteria at the bottom of the flask was poured off and the latter crushed and subjected to hydraulic pressure of 600 atmospheres. Later the extracts from these pressed organisms and the original aqueous solution, previously decanted, were together under pressure passed through a Reichel or Berkefeld filter.

Conclusions.

(1) By the autolytic digestion of carefully killed cholera spirilla in an aqueous fluid the receptors become separated from the bacterial cells and may be filtered off in solution.

(2) The injection of these free receptors into both man and animals furnishes a means of producing high bactericidal and agglutinative blood sera. The antitoxic value of these sera is, however, moderate.

(3) The subcutaneous injection into man of such free receptors is a process which is not only free from any danger, but one which produces practically no local disturbance and only a slight general reaction.

(4) Hence the method is a practical one for producing cholera-immune serum in man.

(5) It is highly desirable that this cholera prophylactic be given a thorough, practical test.

(6) It would appear hopeful that by the application to the pest is bacillus of a slight modification of this method a more satisfactory prophylactic against bubonic plague could be obtained.

A Short Essay on Insanity. By Charles Williams, L.R.C.P., L.R.C.S. Henry J. Glaisher, London, 1905, pp. 22. 1s.

Part I. of this essay is devoted to "The Importance of the Early Recognition of Insanity." Part II. indicates "How to Recognise that an Attack of Insanity is Threatening." This is a carefully and clearly written account of incipient insanity, and well worthy of perusal.

Illustrated Key of the Trematode Parasites of Man. By Ch. Wardell Stiles. Washington, 1904, pp. 66.

The term Distoma formerly indicated a group of the family *Fasciolidæ*, but recently it has been shown to be inapplicable, and therefore has been suppressed. The word Distomatosis is, however, still retained as

a clinically convenient term. Trematodes (Distomatosis) may affect different parts of the human body as follows :—

A.—Eye Flukes.

(1) *Monostomulium lentis.* Habitat, crystalline lens of the eye.

(2) *Agamodistomum ophthalmobium.* Between crystalline lens and its capsule.

B.—Lung Flukes.

(1) *Paragonimus westermanii.* Lung; causing parasitic hæmoptysis and Jacksonian (cortical) epilepsy.

(2) *Fasciola gigantica.* Liver of animals, lungs of man.

C.—Liver Flukes.

(1) *Fasciola hepatica.* Common liver fluke of ruminants and man.

(2) *Dicrocœlium lanceatum.* The lancet fluke. Liver of ruminants and man.

(3) *Opisthorchis felineus.* The European cat fluke. Liver of cats, dogs and man.

(4) *Opisthorchis noverca.* The Indian liver fluke of man.

(5) *Opisthorchis sinensis.* The Asiatic liver fluke. Bile ducts, pancreatic ducts, duodenum and stomach of man and cats.

D.—Intestinal Flukes.

(1) *Fasciolopsis buskii.* Busk's intestinal fluke. Small intestine of man; Asia.

(2) *Fasciolopsis rathonisi.* Rathonis's intestinal fluke; Asia.

(3) *Heterophyes heterophyes.* The Egyptian intestinal fluke. Man, dogs and cats; Egypt and Japan.

(4) *Gastrodiscus hominis.* The Asiatic Amphistome. Cæcum and colon of man; Asia.

E.—Venal Flukes. Bilharziasis or Egyptian Hæmaturia.

(1) *Schistosoma hæmatobium.* Veins of man and certain monkeys; Africa.

PRECIS DE PALUDISME. By Dr. J. Crespin, Paris, 1905, Librairie Maloine. Crespin's work is a complete and lucid exposition of paludism in all its phases.

Notes and News.

THE CLIMATE OF EGYPT.—According to reports from many sources, including that of Dr. Engel, of Cairo, the temperature throughout Egypt seems to be appreciably lowering. The present winter is exceptionally cold; but Dr. Engel contends that it is only during the summer months that the heat is really less.

THE United States Department of Agriculture intends to attempt to acclimatise the Egyptian papyrus in Florida or Louisiana.

A COLOUR-CHANGING PLANT.—In the *Transactions of the South African Philosophical Society* a plant belonging to the genus *Mesembrianthemum* is described as modifying, to some extent, its appearance, in accordance with the environment in which the plant finds itself. One species, the *M. bolusi*, produces two leaves, about the size and colour of a duck's egg, which resemble the stones amongst which it grows. We should like more information on this point.

LIEUTENANT-COLONEL G. BOMFORD, I.M.S., C.I.E., has been appointed Director-General of the Indian Medical Service.

MAJOR H. F. CLEVELAND, I.M.S., has been appointed medical officer to the Ameer of Afghanistan.

THE rates of half-pay for officers of the Indian Medical Service shall, in future, be the same as those laid down for the officers of the Royal Army Medical Corps.

THE Indian Government are encouraging officers of the Indian Medical Service to qualify in chemistry, so as to fit them for the chemical examiners' department. Other forms of specialism are to be encouraged, particularly for sanitary appointments and for asylum work.

MONOCHROMATIC TROUGH.—Messrs. R. and I. Beck, 68, Cornhill, London, E.C., have brought out a light filter for use during the illumination of microscopic objects viewed under high powers. The filter consists of a trough filled with a saturated solution of acetate of copper placed between the lamp and the microscope mirror.

THE "FOWL" TREATMENT OF SNAKE-BITE IN INDIA.—B. B. Ghosal, in the *Indian Medical Gazette* of January, 1905, gives an interesting account of the treatment of snake-bite by the application of a fowl to the wound. His account is as follows: The feathers having been peeled off from around the anus of a live chicken, it was made to sit on the wound, *i.e.*, the anus applied to the wound while a man was holding it in his hand over the wound. After five or six respiratory efforts, it first began to doze, pupils upturned, and then the head gradually fell down upon the chest. It seemed to shake off its drowsiness quickly twice or thrice and inspired again and so imbibed fresh poison. [! ! Ed.] Then the intervals between inspiratory efforts became longer, till at last its head fell on its breast, beak remained permanently open, and so expired. It took about five minutes to die. But notwithstanding the deaths of twenty chickens the patient's condition got worse and worse. It is interesting to note that, after injection of 20 cc. of Calmette's antivenin, fowls applied to the wound did not die, although kept with the anus on the wound for fifteen minutes at a time.

Medical News.

MEDICAL COLLEGE IN CANTON. — The Medical Missionary Society's hospital authorities in Canton have succeeded in obtaining sufficient funds to erect

a building suitable for a medical college. The building is of brick, and measures 83 feet long by 49 feet wide and 75 feet to the top of the observatory. The prospectus recently issued gives details of the course of instruction to be followed. There are ample clinical opportunities obtainable at this well-known hospital.

THE *London Gazette* of January 24th contains a report from Mr. W. Wallace, C.M.G., Acting High Commissioner, in which, in reference to the military operations in Nigeria, he states: "The Medical Staff consisted of Dr. H. P. Lobb and Dr. W. T. Heally, who were devoted to the care of the sick and wounded. I consider them both deserving of much credit."

BRITISH HOSPITAL IN CONSTANTINOPLE.—A new British Seamen's Hospital was opened at Constantinople on January 19th. The Hospital, which contains fifty beds, was erected at a cost of over £30,000.

BANANA FLOUR.—The Banana Food Company, 46, Artillery Lane, Bishopsgate, London, have prepared a flour—bananina—made from the dried unripe fruit of the banana. The flour can be made into a porridge with either milk or water, and is quite palatable.

Medical Appointments.

DR. L. D. PARSONS, Resident Surgeon-Superintendent of the New Providence Asylum, Bahamas, is to succeed Dr. J. E. Ker as Assistant Surgeon, Colonial Hospital, Police and Port Surgeon of Gibraltar. Dr. E. Ker has proceeded to Jamaica as Superintendent Medical Officer.

SIR ALLAN PERRY, Principal Civil Medical Officer of Ceylon, returns to duty from leave of absence next month.

Geographical Distribution of Disease.

As information arrives we publish, under this heading, the principal diseases met with in tropical and sub-tropical countries, so that those interested in the Geographical Distribution of disease may have a means of gathering information concerning the prevalent ailments in different parts of the world.

Corsica.

ANTIMALARIAL CAMPAIGN.

Dr. F. Battesti's report on the third campaign of the Corsican Antimalarial League was read at a meeting of the Paris Academy of Medicine in December last by M. Laveran. Dr. Battesti's statistics show the excellent results attained by metallic screening of doors and windows as a malaria prophylactic. The success was complete in many instances, no malarial cases occurring where the screens were carefully and efficiently used, and even in houses partially protected the number of cases of malaria fell from 47 per cent. to 11·60 per cent. The metal screens in no way interfered with ventilation or with the comfort of the occupants of the houses. Quinine prophylaxis was tried by the members of the league with excellent results. Destruction of Anopheles within a given area was also systematically attempted.

Cholera.

PREVALENCE OF THE DISEASE.

Turkey. — In Asia Minor during the two weeks ending December 19th, fresh cases 332, deaths 292.

Russia.—Between December 8th and 14th, at Djevat, fresh cases 226, deaths 203; Lenkoran, fresh cases 177, deaths 152; Guéoktchiosky, fresh cases 3; Bakou, fresh cases 12; Balakhany, fresh cases 3; Zanzégour, fresh cases 108; Djebrail, fresh cases 20; Samara, fresh cases 17; Sarakoff, fresh cases 11; Transcaspian districts, fresh cases 47.

Japan.

PREVALENCE OF TUBERCULOSIS.

According to recent investigations by S. Kitasato, human tuberculosis is as common in Japan as in Europe and America. Primary intestinal tubercular affections is common in adults and children, whilst it is stated that cow's milk is never given to Japanese children. In several parts of Japan human tuberculosis is prevalent, but the cattle in the districts are quite free of the disease. Experimental inoculation of cattle with tubercle bacilli by way of the veins or peritoneum causes only a mild infection; subcutaneous injection is ineffective. It would appear, therefore that in Japan cattle play no part in the infection of human beings with tuberculosis; and human beings seem incapable of infecting cattle.

Panama.

Six cases of yellow fever are reported to have occurred recently in Panama. Yellow fever is endemic in the district, but it is some time since any cases of the disease have been reported.

Plague.

PREVALENCE OF THE DISEASE.

India.—During the weeks ending December 17th, 24th and 31st, the number of deaths from plague in India amounted to 18,284 19,465 and 22,645, respectively.

South Africa: East London.—One fresh case and 1 death during the week ending December 24th.

Mauritius.—During the weeks ending January 13th and 19th, fresh cases 8 and 10; deaths 8 and 8.

Hong Kong.—During the weeks ending January 7th, 14th and 21st, fresh cases 1, 3 and 3, deaths 1, 3 and 3.

Siam.—Many cases of plague, some fatal, are reported from Bangkok in the *Shipping Gazette* of December 30th.

Straits Settlements.—One case of plague reported on November 22nd.

Aden.—Between December 3rd and 9th, fresh cases 23, deaths 16.

Brazil.—Between October 24th and November 20th, fresh cases 122, deaths 52.

Porto Rico.

ANKYLOSTOMIASIS.

Major Seaman has found that the *Ankylostomum duodenale* is a prevalent parasite amongst the inhabitants of Porto Rico. He is of opinion that the worm gains access through the naked feet of the farm labourers, whence they work their way into the intestines, become encysted, and subsequently develop into the adult worms. Seaman suggests, in addition to general sanitary reforms, that the labourers should be provided with shoes or clogs to prevent infection.

Yellow Fever on the Ivory Coast.

In a recent Foreign Office publication the British Vice-Consul on the Ivory Coast, J. P. Armstrong, draws attention to the prevalence of yellow fever at Grand Bassam, the chief seaport of the colony. Although the Ivory Coast is French territory, Grand Bassam is the port of entry to the British Possessions on the Gold Coast, and the paralysis of trade consequent upon the continuous outbreaks of yellow fever ever since 1899 is so acute that it has been proposed to abandon the town completely. The presence of yellow fever in and around the neighbourhood of the Ivory Coast has been denied by many, and although we are accustomed to refer in an indefinite way to the West Coast of Africa being the original home of yellow fever, whence the disease was carried to the West Indies during the slave traffic periods, yet pronouncement upon the subject has never been conclusive or precise. It would seem now, however, we have a definite statement before us, and it behoves some one to deal with the subject scientifically. That the death-rate amongst Europeans on the Coast is high is apparent from the fact stated by Mr. Armstrong that the mortality rate for 1903 amounted to no less than 50 per cent. of the population. If the French authorities are of the opinion that the disease to be dealt with is indeed yellow fever, it is surprising that they have not learnt the lessons taught us by experiences in Cuba before now, and set to work to exterminate the mosquitoes responsible for the spread of the disease. It is satisfactory to know that quite recently steps in this direction have been taken, and seeing that the marshy land around Grand Bassam does not extend further than about 200 yards, there should be no difficulty in draining or filling in the mosquito breeding grounds.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Lancet," December 24, 1904.

1. Hutchinson, Jonathan. Leprosy in China, p. 1808.
2. Drake, D. G. The Medicine of Assam, p. 1809.
3. Mosquitoes on Board Ship, p. 1811.
4. Cholera and Plague in the Near East.

(1) "LEPROSY IN CHINA.

"TO THE EDITORS OF THE 'LANCET.'

"SIRS,—Will you allow me to ask for information from the numerous readers of the *Lancet* who are personally acquainted with China and the Chinese? What I particularly want to know is whether there are any differences in the conditions of life in North and South China, which may be supposed to explain the prevalence through untold generations of a contagious disease in the one whilst it is entirely absent in the other. As all know, Pekin is in the extreme north of China proper, and Canton in the extreme south. Between them lies an immense inland district bordered by a sea-coast of many hundred miles. Now, in the whole Canton district leprosy is very abundant, whilst in the Pekin district (inclusive of Teintsin, the Liverpool of North China) it is reputed to be absent. It may be that further investigation will prove that the absence is not so absolute as some have assumed, but at any rate the evidence has been sufficient to convince so good an authority as Mr. James Cantlie, who in his prize essay on the subject strongly asserts it. In the district which intervenes the disease gradually diminishes as you go north. There is, of course, the freest possible intercourse between the two districts, and although the Chinese at home are not much given to wandering, opportunities for contagion must be of constant recurrence. In passing, it may be remarked that Mr. Cantlie credits the Chinese of the southern provinces with having introduced leprosy into almost all the islands of the southern hemisphere into which they have immigrated. They have, however, never been able to introduce, or at any rate to perpetuate, it in the northern half of their own kingdom.

"Can any plausible explanation of this extraordinary fact be offered? That the prevalence of leprosy is not influenced by climate, latitude, geological formation, or race, is now acknowledged by all, and the facts quoted would appear to be in direct opposition to any suggestion of contagion. If the Chinese have been able by personal infection to spread the disease in the Sandwich Islands and other places, why should they not with vastly increased opportunities extended over many ages, have succeeded in infecting men of their own race near at home. My own explanation of the facts is ready and definite. North China is a dry, sandy district, abounding in salt, and producing little or no fish. South China has abundant fish and its salt is imported and taxed. The Chinaman can introduce leprosy wherever he goes if only he finds there plenty of fish. His success becomes assured if only there be a deficiency of salt. The agent by which he works is the fish, which he cures so badly. Such is my creed, and I shall feel exceedingly indebted to any of your readers who can offer any other or produce any facts which may qualify it.

"I am, Sirs, yours faithfully,

"JONATHAN HUTCHINSON.

"*December 20th*, 1904."

(2) DISEASES IN ASSAM.

Drake, D. G., Medical Officer Teypur Medical Association, Assam, states that—

(1) Cancer is unknown in Assam amongst natives.

(2) Hepatic abscess is very rare, although dysentery is prevalent.
(3) Enteric fever is extremely rare.
(4) Malaria is very common.
(5) Ankylostomiasis is a great scourge.
(6) Kala-azar is very prevalent.
(7) "Sore foot" is common.

(3) Mosquitoes on Board Ship.

Aflalo, F. G., remarks that he has travelled in a steamer from Queensland to Plymouth Sound, with mosquitoes active in the saloon during the whole period of a voyage that lasted eighty days. He suggests that some of the mosquitoes may have completed their metamorphoses on the voyage, breeding in the residue of rainwater in the ship's buckets, boats, or other receptacles, or in fresh water tanks. Mr. Aflalo suggests efficient cleansing of all likely receptacles of fresh water so as to do away with possible mosquito breeding places.

"British Medical Journal," January 28, 1905.

1. The London School of Tropical Medicine, p. 204.
2. Plague in India, p. 204.
3. Yellow Fever on the Gold Coast, p. 204.
4. Japanese Students, p. 205.
5. The Antimalaria Campaign in Corsica, p. 205.
6. Ankylostomiasis amongst Miners, p. 217.
7. Health in West Indies. Robert Boyce, F.R.S., p. 223.

With the exception of articles 4 and 8, all the above are dealt with elsewhere in the present issue of the Journal of Tropical Medicine.

(4) Japanese students are reported by M. Revon, for some time a Professor in the University of Tokio, to suffer from devotion to their studies. Several of the students are stated to have died from over-study. The determination of the Japanese to attain efficiency is in no branch of learning more marked than in medicine, and the Japanese maxim, "Oudji yori sodatchi," meaning "Education is more than birth," is acted up to with untiring zeal.

(8) Professor Boyce, of Liverpool, writes contradicting a statement attributed to him on returning from West Africa, that "West Africa is likely to become a health resort." The health of Europeans in many of the coast towns shows a marked improvement in recent years, owing to antimalarial work and improved sanitation generally, but Professor Boyce does not wish to imply that the improvement is so rapid as some would gather from the remarks wrongly attributed to him.

Epidemiological Society, December 9, 1905.

Ticks and Tick-transmitted Diseases.

Nuttall, G. H. F., at the meeting of the Epidemiological Society, read a paper on "Ticks and the Diseases transmitted by Ticks." Ticks are blood-sucking parasites belonging to the order *Arachnidæ*, and attack most of the mammalia and birds, some reptiles, and several insects.

Pathologically, ticks are interesting, from the fact that they are the intermediary hosts of the piroplasmata (and of one spirochæte) which induce in cattle, horses, sheep and dogs, diseases such as the Texas or red-water fever in America and Queensland, and the Rhodesian fever in South Africa. The female lays its eggs on the ground, and the young larvæ attack the cattle and other animals that come within their range. Cattle are attacked in America by the *Rhipicephalus annulatus*, in Queensland and Africa by the *R. australis*, and in Rhodesia and the Cape by *R. appendiculatus*. Sheep in Europe are attacked by the *Rhipicephalus bursa*, and in Africa by the *Amblyomnia hebræum* (Koch). Dogs in South Africa are attacked by the *Hæmaphysalis leachii*, and in Europe by a dermatocentor. Man and several animals are attacked by the *Argus persicus* in Persia, Africa, and the Rocky Mountains.

The incubation period in Texas and Rhodesian fever in cattle extends to eight or ten days, and in dogs to fourteen or twenty-one days.

In animals that recover from the fever, immunised or "salted" cattle, the piroplasmata persist in the blood for an indefinite time, rendering such animals dangerous to others. The *Piroplasma trigeminum* of Texas fever and the *Piroplasma parvum* of Rhodesian fever are not mutually protective.

The only hope of eradicating the disease lies in the extermination of the tick by insecticides, by burning the grass of infected pastures, and by quarantine, which could be accomplished by allowing horses only to be pastured for two years in the fields where cattle had suffered from fever, and *vice versâ*, so that the respective ticks might be starved out. Referring to the geographical distribution of the disease, Dr. Nuttall states that at the present time tick fever is met with as follows:—

(1) Bovine piroplasmosis (Texas or red-water fever) occurs in the United States of America, West Indies, Venezuela, Uruguay, Paraguay, Brazil, and various parts of Europe, Africa, India, China, the Philippine Islands, and Queensland.

(2) Rhodesian fever (bovine) occurs in Rhodesia, South East Africa, and apparently in Transcaucasia.

(3) Ovine piroplasmosis occurs in Roumania, Italy, France, in South Africa, the West Indies, and the United States.

(4) Equine piroplasmosis occurs in Germany, South Africa, Madagascar, and Venezuela.

(5) Canine piroplasmosis is met with in France, Italy, North and South Africa, and India.

In Brazil and the Argentine a tick—the *Argas miniatus* — caused a disease in fowls, the specific organism being the *Spirochæte marchouxi*. Particular interest attaches to this disease, owing to the fact that Schaudinn had recently described a spirochæte developing out of a trypanosoma, which was itself a phase of the halteridium, an endoglobular parasite of birds.

Sir Patrick Manson, who presided at the meeting, remarked that the reference in Dr. Nuttall's paper to the conditions under which piroplasmosis recurred was particularly interesting, as illustrating the etiology of blackwater fever, which might be a disease of this kind, the malarial attack or the large dose of quinine simply acting as an exciting cause. The karapatti disease of man occurring along the Zambesi was spread by a tick—the kufu. Probably the karapatti disease and blackwater fever are examples of

human piroplasmosis. Dr. G. C. Low, of the London School of Tropical Medicine, took part in the discussion, and remarked that a spirillum had been demonstrated in karapatti disease. Rhodesian fever was spreading southwards and destroying some 90 per cent. of the cattle.

"Annales de l'Institut Pasteur," June, 1904.

1. (No. 6) Sur quelques propriétés physiologiques des différents venins de Serpents. By F. Noc.
2. (No. 7) Etudes sur quelques epizootics de l'Indo-Chine. By M. Yersin.

"Gazette des Hopitaux," December 24, 1904.

ELEPHANTIASIS.

Carle and Jambon describe elephantiasis as originating from nervous causes in trophic œdema, in trophoneurosis, in interstitial neuritis and in tabes. Whether it arises in the veins or in the lymphatics, or whether it is caused by an external infection of the skin or an internal hardening, inflammation is the primitive lesion in each and every case. The microscope shows small round cells, surrounding dilated capillaries with thickened walls covered by a cell-infiltrated cutis. The interstitial hyperplasia of the skin is due to inflammatory œdema. Mechanical blocking alone is not sufficient to cause elephantiasis, though it is a factor usually present.

"Le Caducée," December 17, 1904.

SPIRILLAR DYSENTERY.

Dantec, from a clinical study of spirillar dysentery in Bordeaux, states that there is no increase of temperature in spirillar dysentery which at once distinguishes it from dysentery of the bacillary type. The liver is not affected even though the disease may become chronic, thus distinguishing the affection from dysentery of the amœbic variety. Though fairly common at Bordeaux, no cases of the disease have been recorded except in the west of France. It is rapidly cured by antiseptic enemata; treatment by the mouth has little effect. Diagnosis is made by placing a piece of mucous membrane obtained from the stools on a slide. A grey central part is seen surrounded by a transparent white of egg margin. The central part is teased out, stained, and washed with water; alcohol has the disadvantage of decolorising the specimens, which stain faintly. Cultures on agar develop bacilli not staining by Gram; these may be *Bacillus coli* or early forms of spirilla, though the change from bacilli into spirilla has not been seen. No *post mortem* has been made, as all the cases recovered.

"Progrès Médical," November 26, 1904.

Sur la nature de la pretendue fièvre jaune de Panama (On the Nature of the So-called Yellow Fever of Panama). By Dr. Urriola.

Urriola thinks that the so-called yellow fever is not yellow fever at all, but a malignant form of malaria.

"Semaine Médicale," December 7, 1904.

La rougeur vive et sèche de la langue comme signe pathognomonique des abcès tropicaux du foie (Red and Dry Tongue a Sign of Abscess of the Liver). By H. de Brun.

"Thesis de Lille," 1904.

ACTINOMYCOSIS OF THE MAMMA.

Poiteau describes invasion of the breast by actinomycosis through cracks in the nipple, rarely through the ducts. The disease passes through three stages: invasion, inflammation and suppuration. The part affected is the connective tissue of the organ, which becomes indurated and compresses the gland tissues; it is seldom the gland tissues are primarily affected. At first, when the disease is only suspected, iodide of potassium treatment should be adopted; when this fails, or when the disease is advanced, all the indurated tissue should be freely removed. Enlarged axillary glands, when they exist, do not require removal, as the parasite is not present in them.

"Arch. für Schiffs and Trop. Hyg.," December, 1904.

Mission to Brazil for the Study of Yellow Fever, February 10th to July 4th, 1904. By MM. Otto and Neumann.

Otto and Neumann declare that none of the plans adopted in Brazil for the eradication of yellow fever have proved efficacious.

"Arch. für Schiffs und Trop. Hyg.," vol. vi., 1902.

THE ANOPHELES OF WEST AFRICA.

Dr. Hans Ziemann collected a large number of mosquitoes in Duala and vicinity, between March, 1899, and April, 1900; in Victoria (Cameroon Mountains), in May, 1900; in Little Popo, Togo and vicinity, in June of the same year, and in July he collected a number in Monrovia. The specimens were immediately despatched to Europe for classification, and Theobald described some zoologically, while Dr. Enderlein, of the Zoological Museum in Berlin, undertook to classify the Anopheles; the Culices have hitherto not been classified.

Dr. Hans Ziemann found it a general rule that the Anopheles were incredibly more numerous during the rainy season and the time of transition from drought to rain than during the dry season. It was a peculiar circumstance, that whereas a still unclassified culex was found on the Cameroon Mountains, at an altitude of 1,600 metres, Anopheles were never found to exist in Buëa, situated at an altitude of only 900 metres, and which is considered to be the healthiest place in the Cameroon Mountains.

In the Molive Plantation, near Victoria, 220 metres above the level of the sea, Anopheles were still very frequent, while in the Boana Plantation, 260 metres above sea-level, they were very scarce. Moreover, Dr. Ziemann found that the Anopheles in Victoria were all capable of sucking human blood within a few hours after they had emerged from the pupa, while the Anopheles in Togo could only be induced to suck twenty-four, sometimes forty-eight, hours after their exit from the pupa. The following is the list of the Anopheles found:—

Anopheles costalis, Loew. Very frequent in Cameroon on the Joss Plain, especially in the rainy season, also on the upper reaches of the Wuri River, in Victoria, on the Cameroon Mountains. Moreover, in Togo, in the Nachtigall Hospital, in Upper Guinea, and in Monrovia.

Anopheles funestus, Giles. Frequent in the huts of the natives in Victoria in the rainy season.

Anopheles Pharœnsis, Theobald. Frequent on the upper reaches of the Wuri River, near Duala; found also in Victoria, at the foot of the Cameroon Mountains, in September; also in Lome, Togo, and in Upper Guinea.

Anopheles Ziemanni, nov. spec. (described by Grünberg in the *Zoolog. Anzeiger.*, vol. xxv., No. 677, July, 1902). On the Wuri River, in large numbers, but never observed in Duala, close by.

Anopheles costalis, *funestus*, *Ziemanni*. All these kinds are transmitters of Malaria.

"Deutsche Medizinische Wochenscrift," December 8, 1904.

INFECTION WITH ANKYLOSTOMUM THROUGH THE SKIN.

Lambinet injected several hundred larvæ of ankylostoma beneath a dog's skin. The animal died twelve days after, when the middle portion of the small intestine, not the duodenum, was found to contain several hundred young worms of the same age. These resembled the worms found after the same length of time in cases of mouth injections. In the part of the intestine occupied by the worms the mucous membrane was seen to be covered with blood-stained mucus and exhibited recent hæmorrhages.

"Gazetta degli ospedali edelle cliniche," November 13, 1904.

MIGRATION OF ASCARIDES FROM THE INTESTINE INTO THE PANCREATIC DUCT, FOLLOWED BY AN INTERSTITIAL PANCREATITIS.

G. Ghedini verified the presence of ascarides in the pancreatic duct, and the substance of the pancreas itself, in a child who died after suffering from indefinite abdominal and cerebral symptoms. The child had complained of recurring abdominal pains and inveterate hiccough, and developed cerebral symptoms resembling basilar meningitis.

"Il Policlinico," November, 1904.

Arterial Pressure Changes in Malarial Infection. By G. Quadri.

Sphygmomanometer traces, by Quadri, in cases of malaria give the following results:—

(*a*) A slight rise in arterial tension, varying with the length of infection and the resistance of the individual, but is not affected by the type of the parasite.

(*b*) The heart muscle responds to digitalis, but its time effect was of shorter duration and of less marked extent than in healthy persons.

"Roussky Yratch," November, 20, 1904.

DYSENTERY IN MANCHURIA.

V. G. Korotchenski, in his report on dysentery among the Russian troops in Manchuria, gives details of the treatment of the disease by Shiga's and Gabritchevsky's serum. In all, 70 cases of dysentery were treated by doses of from 20 cc. to 110 cc. at one injection. In mild cases, 20 cc. of the serum proved sufficient to check the disease; in severe cases, 60 cc. were necessary; and in very severe attacks, 100 cc., repeated when required, were administered. In advanced and neglected cases the serum proved useless, but when given early, the treatment seemed more effective than any other mode of treatment. In no case treated by this serum did a relapse occur, nor did acute dysentery become chronic. No other form of treatment was followed until the evacuations became fæcal, when irrigation of the bowel by potassium permanganate solution, and bismuth or salol by the mouth, were at times employed.

"Roussky Yratch," December 4, 1904.

The Cholera of Baku. By I. M. Leplinski and I. S. Eliashvili.

Baku gets its water supply partly from the Caspian Sea and partly from wells. The water from the wells has a bitter and slightly salt taste, and the sea water is distilled for consumption. An examination of the water from the swimming baths showed cholera vibrios, and when those baths were closed cholera subsided. The baths were mere tanks, which were "cleaned" once a month, and in the baths clothes were washed and ablutions performed. During the cholera epidemic the authorities prohibited the use of the baths.

"New York and Philadelphia Medical Journal," July, 1904.

OBSERVATIONS ON DYSENTERY IN THE PHILIPPINES.

F. M. Hartsock states that in the Philippines dysentery occurs in three distinct types:—

(1) Catarrhal dysentery, due probably to a hyperæmic condition of the chylopoietic viscera, plus irritation produced by bacterial, parasitic or chemical agencies.

(2) Acute specific dysentery, in which a bacillus "related in its cultural and physiological properties to the *Bacillus typhosus*, which agglutinates with the blood of patients suffering from this form of dysentery.

(3) Amœbic dysentery is dependent upon or associated with the presence of a parasitic amœba. Of the several terminations of the amœbic form the most common, according to Hartsock's observations, is in sprue.

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Original Communications.

SOME CASES OF INTEREST IN THE WARDS OF THE SEAMEN'S HOSPITAL, ROYAL ALBERT DOCKS, LONDON.

By James Cantlie, M.B., F.R.C.S.
Surgeon to the Hospital.

I.—Deep-seated Hydatid in the Lung; Operation; Recovery.

The patient came into hospital under the care of Sir Patrick Manson, suffering from signs and symptoms of hydatid of the left lung. He had been in Australia, where, no doubt, he caught the infection. On admission the cough was troublesome and the expectoration contained from time to time pieces of hydatid membrane of a fair size, the larger pieces measuring 1½ inches by 1 inch. Pus, some blood, and a considerable quantity of sero-sanguinolent frothy mucus was coughed up several times a day, but no hooklets were ever observed. On the side of the chest, about midway between the spine and sternum, the percussion note was of rather higher pitch than elsewhere, but the breath entered freely over the patch. There were no signs of pleurisy. The temperature towards the evening rose regularly a degree or two, the patient suffered considerably from bursts of tormenting cough, and although his appetite was fairly good, he lost weight to some extent.

The *diagnosis* pointed to a deep-seated pulmonary hydatid which had burst into a bronchus near the root of the left lung.

The cavity was surrounded by healthy lung, so that between it and the surface some three or more inches of healthy lung intervened, with no pleuritic adhesions.

Operation.—Under an anæsthetic a T-shaped incision was made two inches in front of the angles of the seventh and eighth ribs, and two and a half inches of each of these ribs removed, the pleura being left intact. An attempt was made to transfix the lung by passing a curved needle rapidly through the uninjured pleura and lung. The moment the needle punctured the pleura, however, the lung retracted and air entered the pleural cavity. The wound was thereupon packed and the ordinary dressings applied. The signs and symptoms of pneumothorax continued for forty-eight hours, when all evidence of air in the pleural cavity disappeared. On the eighth day succeeding the operation the wound was dressed, when the opposite layers of the pleura were found adherent. On the twelfth day the hydatid cavity in the lung was searched for by the needle of an aspirating syringe. The cavity was reached at the first puncture four and a half inches from the level of the skin (three inches from the exposed pleural surface) and pus and sero-purulent fluid drawn off. Along the tract of the needle a long, narrow trocar and cannula was introduced, the trocar withdrawn and through the channel of the cannula a filliform bougie introduced and tied in place. After three days, hollow, straight dilators (such as are used for dilating urethral strictures), of graded increase in size, were passed rapidly one over the other, using the filliform bougie as a guide, until a size corresponding to a No. 14 English catheter was reached. A large trocar and cannula was introduced along the channel thus made, the trocar withdrawn, and through the cannula a tube one-third of an inch in diameter stretched up a long steel rod, after the manner I employ for liver abscess (Manson's method), was introduced and the cavity left to drain. After a few days the forefinger was easily introduced along the tract thus formed, the parts well dilated and iodoform gauze packed into the wound. Gradually the discharge ceased, the cavity and tract healed, and the patient left the hospital well.

The difficulty in this case was how to reach the hydatid through an intervening layer of healthy lung three inches deep.

II.—A Pebble in the Prostate; Perineal Lithotomy without a Staff.

A lad, aged 16, came into the hospital under Sir Patrick Manson's care with indefinite abdominal symptoms. The urine contained blood occasionally, pain over either kidney was complained of at intervals, and there occurred colicky pains with alternating constipation and diarrhœa. Examination of the bladder by a sound proved negative. The history and physical signs were so indefinite that an exploratory laparotomy was performed by Mr. William Turner, but no abnormality of any kind was detected. Subsequently the right kidney was explored, with the same negative result. When the patient came into my charge the signs and symptoms pointed to the urethra as the seat of trouble; and as it was impossible to introduce a staff into the bladder, I operated without a guide. The bladder was opened by a median perineal incision, and the knife, as it reached the prostate, grated upon a hard substance in the prostatic tissue which, when removed, proved to be a small pebble about the dimensions of a full-sized green pea. The wound healed speedily, and the patient made a good recovery. Before leaving the hospital the lad confessed to having pushed a pebble up the urethra and worked it backwards along the channel as far as he could. The pebble had become gradually imbedded in the prostatic tissue, causing occasional hæmorrhage, intermittent retention of urine, and indefinite abdominal pains.

III.—A Case of Bilharzia, in which a Calculus Formed Round Silk Ligatures that had Dropped into the Bladder after Suprapubic Lithotomy.

The patient, a European, some time resident in Egypt, had been the subject of bilharzia for some two years before admission to the Seamen's Hospital under Sir Patrick Manson. When he came under my care he was suffering great pain at frequent intervals in the perineum and along the urethra, and through the centre of a supra-pubic scar, the result of a previous exploratory operation upon the bladder, a fistulous opening discharged urine continuously.

The patient was in a sorry plight, suffering excruciating pain at intervals, with urine dribbling from a

supra-pubic fistula, regular exacerbations of fever at night, wasted in frame, and depressed in mind.

Operation.—A left lateral lithotomy was performed on February 9th, 1904, when a large friable calculus was found occupying the whole of the lower part of the bladder. I found it impossible to remove the calculus intact, owing to its size and to the readiness with which it broke down when touched. The fragments and gritty material were partly scooped away, and then the bladder was freely washed out with plain warm water from the old supra-pubic fistulous opening, the water escaping by the perineal wound. A large lithotomy drainage tube was introduced through the perineal wound. The patient did well, and the supra-pubic fistula gradually contracted and healed.

In the largest piece of calculus removed a silk ligature was found firmly embedded and evidently serving as the nucleus of the entire calculus. That this came from the old supra-pubic wound was evident, because during the process of healing a similar ligature was found protruding from the supra-pubic wound. The former had evidently dropped down from the wound on the dome of the bladder to within its cavity, whilst the latter was retained in the edge of the original wound. The calculus was composed of the ammonio-phosphate of magnesium.

General Remarks on Lithotomy.

The cases just related constitute the 76th and 77th cases of lithotomy I have performed. Of these, all were by way of the perineum, except one by the supra-pubic method. Of the perineal lithotomies, 65 were by left lateral pithotomy, 10 were by median lithotomy, 1 by right lateral lithotomy. Except for an operation to afford relief *in extremis* all the perineal lithotomies recovered. The supra-pubic case died.

The circumstances under which the supra-pubic operation was performed were as follows: There were three cases for lithotomy at the Alice Memorial Hospital, Hong Kong, to be done on one day. I had just done two lateral lithotomies, and the third patient was being put into the lithotomy position, when Inspector-General Lloyd, C.B., R.N., who, along with several navy and army surgeons, were present at the operations, asked me why I did not do the supra-pubic operation. I protested that I had always denounced the supra-pubic method of opening the bladder as being a regression to mediæval methods, an unscientific procedure, and dangerous to the patient. However, I was over-persuaded. The patient was taken down from the lithotomy position, a rectal bag introduced into the bowel, distended with air in the usual manner, and the supra-pubic operation proceeded with. The operation was carried out to my own and the onlookers' satisfaction, and a large stone removed. The only complication that occurred during the operation was that the india-rubber air-bag introduced into the rectum burst just when the bladder was being opened. It seemed at the time as though no untoward development had occurred, but as the patient died some days afterwards it was inferred that the occurrence had to do with the result.

Curiously enough, Dr. John Bell, then surgeon in the same hospital with myself, now Senior Medical Officer in charge of the Government Civil Hospital, Hong Kong, had performed a series of lateral lithotomy operations with complete success. The only case of lithotomy he lost up to the date I speak of, 1896, was one performed by the supra-pubic method. It may have been a coincidence that the only cases of lithotomy lost by Dr. Bell and myself were performed by the supra-pubic method. It may have been want of surgical skill on my part, but this argument cannot be advanced against Dr. Bell. If more skill is required for the supra-pubic operation than for the perineal operation, then surgeons of indifferent capacity should do the latter in preference to the supra-pubic method. I am, however, not yet convinced as to the superiority of the supra-pubic operation for removing calculi (or even of other growths) from the bladder, and the two cases of lithotomy I record above still further confirm me in my opinion. The pebble in the boys prostate could never have been discovered had the bladder been opened by the supra-pubic method. In the latter case, in fact, the operation caused the calculus, the concretions collecting round a ligature which had dropped into the bladder.

The supra-pubic method of performing lithotomy I still regard as a surgical regression, as an unscientific method of dealing with. The only recommendation, perhaps, it possesses is that it is easy of performance and for the indifferent or inexperienced surgeon it has advantages.

IV.—Injury to Right Side of Cranium in Childhood; Left Paresis; Epilepsy; Operation; Cyst in the Brain; Recovery.

Preliminary Note.

W. B., a man aged 20, was hit by a cricket ball on the right side of the cranium when eight months of age. He remained unconscious for three weeks and recovered with paresis of the left upper and lower extremities. When sixteen years of age he developed epilepsy, having as many as seven or eight fits during the twenty-four hours. Under treatment the frequency and severity of the fits subsided, until they were reduced to about one per week; on leaving off medicine the fits recurred. Treatment again reduced the fits to about two during the week, for about four months before admission. The patient on admission showed a scar and irregularity of bone over the right parietal region, some limping with the left foot in walking, stiffness of left elbow, and the left hand inclined to be claw-like. The patient was sent by Dr. Outterson Wood, at the patient's own request, to be operated on.

Operation.—On October 26th, 1904, the right Rolandic area was exposed by a horse-shoe-shaped flap of scalp and bone.

The skull just below the parietal eminence was a mere shell for about the area of one inch, and on the inner aspect of this piece of bone the dura mater was firmly adherent. On detaching the bones and dura mater a cyst was opened, from which fluid resembling cerebro-spinal fluid escaped; the cyst wall was enlarged and the finger introduced into the cavity. The cyst led below into the right lateral ventricle, the floor of which could be both seen and felt. The walls of the

cyst bled very freely, but cerebro-spinal fluid ceased to flow, showing that although the cyst opened into the right lateral ventricle that cavity was shut off from the other brain spaces: the cavity was packed with iodoform gauze. The patient on the fifth day after the operation developed a high temperature, 104°, and had one or two well-marked rigors. Removal of the gauze found the wound quite healthy, but a copious hæmorrhage ensued and the wound had to be packed again, and some pressure applied. The temperature gradually fell, the packing was left off, and the wound healed kindly. During recovery the patient had what appeared to be an influenza attack, and two or three epileptiform attacks ensued. Since then, however, only one very slight "attack" has occurred, so that from the first week of November, 1904, to the second week of February, 1905, the patient has been almost free from epileptic seizures. Power in the arm and leg is somewhat increased since the operation.

V.—Five Cases of Liver Abscess during 1904; Recoveries.

Case 1.—V. R., a Lascar, aged 25, was admitted under Sir Patrick Manson's care with pain in the region of the liver. Dulness commenced above at the level of the fifth rib in the nipple line, and extended horizontally backwards from this point to the spine. The lower border of the liver was not advanced beyond the normal limit, but on rapidly succussing the liver by one hand beyond the right lower rib and the other hand on the epigastrium, severe pain was elicited, showing the lesion to be in the supra-hepatic region.

On May 6th, 1904, pus was found by the sixth puncture of the needle of an aspirating syringe three and a half inches from the surface in the nipple line. A large (liver abscess) trocar and cannula was introduced far back in the axillary line, the trocar withdrawn, and a large india-rubber tube stretched on a metal rod (Manson's method) was introduced into the cavity. Pus flowed freely, and the syphonage method of drainage established. There was some delay in recovery owing to the removal of the tube at too early a date, but in reintroducing the drainage tube the patient made a good recovery. In this case no history of dysentery was obtainable. Pus contained mixed micro-organisms.

Case 2.—S. K., a Lascar, aged 21, after a fall on board ship, complained of pain over liver. An incision was made two weeks before admission over the seventh interspace in the anterior axillary line whilst on board ship and the abscess opened.

On admission on September 1st, 1904, the patient had a normal temperature, but looked ill. Through the wound in the right side a probe could be passed along a sinus for the distance of four and a half inches downwards and backwards into the liver. A large quantity of liver pus flowed from the wound.

A tube stretched on a metal rod was inserted into the abscess along the old sinus on September 1st.

On September 30th the tube was removed, and by October 5th the wound was entirely closed.

No history of dysentery ascertainable. The fall on board ship seems to have been the origin of the trouble, so that the abscess may have been of traumatic origin.

An abscess of the liver, however, due to injury, is a rare occurrence, and as this patient came from India, and may have had intestinal troubles of a dysenteric nature, the conclusion as to the lesion being of traumatic origin is not positive.

Case 3.—H. J. T., aged 42, British. In May, 1903, had an attack of dysentery whilst residing in British Guiana; the dysentery continued until March, 1904, when the bowel trouble mostly subsided; but he began to have indefinite pain in the region of the liver and to cough up yellow matter from the lungs, tinged at times with blood.

On admission to hospital on July 2nd, 1904, the cough was distressing, lying down was almost impossible, and he expectorated some twelve ounces of dark reddish-brown sputum with slightly nauseous odour every twenty-four hours. The liver did not reach beyond the normal limits below, but the upper dulness extended almost horizontally backwards from the level of the fourth interspace in the nipple line.

On July 7th pus was found at the first puncture in the seventh right interspace, just in front of the mid-axillary line. A large trocar and cannula was inserted, the trocar withdrawn, and a stretched rubber tube introduced along the cannula, and the cannula withdrawn. Syphonage was employed, and during the first twenty-four hours 14 ounces were drawn off. Immediately after the operation expectoration ceased, and the temperature fell to normal.

On July 14th dysenteric stools were passed, but on the following day the dysentery ceased. On August 8th the patient left, quite recovered.

Case 4.—A. S. G., aged 25, British. Had lived three years in India. Had dysentery twice. April 22nd, 1904, operation for liver abscess; pus was found at the fourth puncture in the seventh intercostal space in the mid-axillary line. The abscess was treated in the usual way by trocar and cannula and syphon drainage. Ten ounces of pus escaped at first puncture, and 12 ounces by syphonage during the first twenty-four hours. On May 5th bile and mucus only escaped by tube. On May 14th the patient left, quite recovered.

Case 5.—W. W., aged 44, British, a resident in the Congo. May, 1903, had dysentery. In June got hepatic pain with high temperature. This condition continued until November, when a chocolate expectoration developed and pus pointed between tenth and eleventh right ribs in the axillary line. The abscess was incised by a surgeon on the Congo, and a quantity of pus escaped. On admission to the Seamen's Hospital on February 11th, 1904, chocolate-coloured pus was being expectorated in quantities, and pus flowed from the old wound; the patient was wasted and slightly jaundiced. On February 12th I opened up the old wound and found pus between the diaphragm and the ribs, and an aperture in the diaphragm which led to the liver. The wound was opened up and freely drained. On February 18th the patient developed a tertian malarial fever, confirmed by blood examination. With appropriate quinine treatment the fever subsided, and on February 27th the patient left the hospital with the liver abscess healed.

VI.—Abscess in Upper Lobe of Right Lung, with Empyema in an Old Case of Liver Abscess.

F. H. D., aged 26, British. Seven years in India. Had dysentery in Assam in 1899. On October 19th, 1903, developed signs and symptoms of liver disease; was operated upon in India by an incision in the right axillary line over the seventh intercostal space. The cavity was drained and allowed to heal. Returned to England, April, 1904; on way home became ill with cough and fever again. On admission to Seamen's Hospital on May 19th, 1904, the lower border of the liver was in normal position; the dulness along the upper border extended upwards and backwards, merging with the dull lung area at the right base. On May 25th the liver was searched for pus; no pus was found, but the needle again and again struck a hard mass in the upper part of the liver, which was assumed to be, and was proved afterwards by *post-mortem* examination to be, the seat of the old liver abscess, now a mass of indurated fibrous tissue. On May 26th pus was found in the lower part of the right pleura cavity. The large trocar and cannula was inserted, and a large drainage tube introduced in the usual way. Pus flowed freely by syphonage. On June 1st, owing to the quantity of pus coming away, 2 inches of the eighth right rib were removed in the axillary line. On June 9th a counter-opening was made between the angles of the ninth and tenth ribs, and a drainage tube passed through from one opening to the other. The quantity of pus was so excessive that the portions of the two ribs between the drainage apertures were removed to the extent of 4 inches, and the cavity examined by the hand introduced into the chest and by illumination. The lower lobe of the right lung was seen to be collapsed, and pus was seen coming from the upper part of the chest cavity. The patient died shortly afterwards from exhaustion. *Post-mortem*. A healed abscess was found in the liver; there was no pus in the lower lobe of the right lung, but in the upper lobe a large abscess existed which discharged freely into the pleural cavity, and proved to be the source of the pus in the pleura. There was no continuity between the abscess in the lung and the liver abscess; the pulmonary abscess must have been embolic in nature. The only treatment available in a case of the kind, with the lower lobe collapsed and the upper lobe destroyed by an abscess, would have been removal of the entire lung.

BUBONIC PLAGUE IN SIAM.

By Percy A. Nightingale, M.D.

The first known case of bubonic plague in Siam was discovered in Bangkok on December 21st, 1904. The outbreak occurred among the Bombay Indian traders on the west bank of the river, and some eight fatal cases took place within the first two or three days. By the last mail the disease did not seem to be gaining ground, but since then telegrams have announced several more deaths.

Bangkok was founded 123 years ago, and contains a population of over half a million, of whom some 220,000 are Chinese. Eight years ago a Sanitary Department was established, Dr. Nightingale being the first Medical Officer of Health, but the work progressed slowly at first—reforms not being easily initiated in a treaty port, while the shipping community did not seem to appreciate the necessity of quarantine regulations against arrivals from infected Chinese ports.

By degrees a great improvement took place, and sanitation is now making rapid strides, in spite of many drawbacks incidental in a large mixed population.

The present Medical Officer of Health, Dr. H. Campbell Highet, devotes his whole time to his official duties, and has a well-equipped bacteriological laboratory at his disposal. He is taking most energetic measures to stamp out the disease, and has been practically given a free hand by the Siamese Government in the matter.

It is to be hoped that these measures will be successful, though on account of climatic conditions, and the density of the population in the Chinese quarter, the task will by no means be an easy one.

"Revista de Medicina Tropical" of Havana, November, 1904.

Filariasis; Preliminary Notes Deduced from Practical Experiments, Showing the Site where the *Filaria Nocturna* Leaves the Body of its Host, "*Culex Pipiens*." By Dr. M. G. Lebredo.

Dr. Lebredo corroborates the discoveries of Low and James as to the presence of filariæ in the labium of the mosquito.

This discovery suggested the possibility of the filaria leaving the mosquito through its proboscis; but through what part of the labium? and how? and when? are points that as yet have not been determined by actual observation.

His observations, which he is about to publish *in extenso*, show that the filariæ reach their full development after the fourteenth day, when they find their way to the head and proboscis of their host; if the normal conditions for their exit have not presented themselves, the filariæ are to be found in the head and labium of mosquitoes as late as the thirty-eighth day after infection, although the insects were fed exclusively on sugar and water after their first meal of blood.

His experiments lead to the following preliminary conclusions:—

(1) The filariæ escape from the live mosquito through the labium when they have reached a certain stage of development, provided that certain conditions are present. These conditions can be produced and reproduced at will, and form an interesting experiment.

(2) The filariæ leave the live mosquito through the *extreme point of the labium*. After a few vigorous efforts they break through the integument at the point of the labium.

Note.—These experiments would tend to confirm Dutton's explanation of the escape of the filarial embryo. J. E. N.

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LEPROSY IN CHINA.

MR. JONATHAN HUTCHINSON'S letter to the *Lancet* of December 24th, 1904, which we published on February 1st, 1905, will, it is to be hoped, elicit a response from some of the many capable observers in China. Mr. Hutchinson's request is to the effect that further investigation be made to test Mr. James Cantlie's statement as to the absence of leprosy "in the Peking district." Mr. Hutchinson himself supplies an explanation, as follows:—

My own explanation of the facts is ready and definite. North China is a dry, sandy district, abounding in salt, and producing little or no fish. South China has abundant fish and its salt is imported and taxed. The Chinaman can introduce leprosy wherever he goes if only he finds there plenty of fish. His success becomes assured if only there be a deficiency of salt. The agent by which he works is the fish, which he cures so badly.

There are now two questions to answer: (1)—Mr. Cantlie's statement as to the absence of leprosy in the northern provinces of China (except Shantung), including Manchuria; (2)—Mr. Hutchinson's statement that the badly cured fish of South China is in any way explanatory of the peculiar distribution of the disease in China. In his National Leprosy Fund prize essay, Mr. Cantlie states that during his travels in Chihli he did not see any lepers, and quoted Drs. Dudgeon, Marston, Frazer, Irwin, and Cheong, as severally maintaining that leprosy did not exist in Peking, Tientsin, nor anywhere in the Province of Chihli. Mr. Doolittle, in his report on social life of the Chinese, pp. 524-527, describes two large leper asylums he visited at *Tientsin*. It is now known, however, that Mr. Doolittle made a mistake, that he referred to Amoy, and not to Tientsin, where no leper hospital within the memory of man has ever existed. In reference to the absence of *salt* as a factor in the development of leprosy, Mr. Cantlie, in the essay referred to, writes as follows:—

Salt.—The absence of salt from the diet for any length of time is held to be a factor in the development of leprosy; and in India the rise and fall in price of rice is popularly believed to play a part in the appearance of the disease. The explanation of such a belief is easily enough interpreted. When any form of food is scarce, especially such an essential as salt, latent leprosy will speedily show itself; and persons, before they were deprived of the food in question, were perhaps never suspected of being lepers.

The two chief sources of salt in China are the salt wells in Sze-chuen, and the salt mills near Taku at the mouth of the Pei-ho River. The former may be considered the southern, and the latter the chief northern, source. Now at first sight it would seem as if there might be something in the theory, for are not Kwang-tung and Fokien maritime provinces far removed from the salt regions? On looking more carefully into it, however, cause and effect are not so pronouncedly linked. It is true the hot-bed of leprosy, namely, Kwang-tung (Canton) and Fokien provinces, are between 2,000 and 3,000 miles removed from the salt sources; and in the neighbourhood of the Pei-ho River, the district whence salt is exported to the provinces mentioned as most leprous, no leprosy exists. Further, there is a salt tax in China, which no doubt tends to make the people look upon salt as a luxury more or less. Sea carriage from even Taku, or far-away Sze-chuen by river, is a very cheap transit in China; and the salt tax is not so heavy as to deprive the fairly well-to-do of the article. That the poor classes may be stinted at times there can be no denying. On the other hand, consider the salt supply of Manchuria; the salt has to be carried from the Pei-ho near the sea-coast, first by boats up the river, and then on camels' backs many days journey beyond the Great Wall—an expensive and somewhat precarious source—yet there is no leprosy met with in Manchuria. The deprivation of salt cannot, therefore, be considered to hold good in China as a cause of leprosy; although the want of salt in the diet of leprous people will no doubt hasten the development of the symptoms of the disease.

LIVERPOOL SCHOOL OF TROPICAL MEDICINE.

ON January 30th, Sir Alfred Jones, K.C.M.G., Chairman of the School, entertained at luncheon the members of the expedition recently returned from the West Coast of Africa. The guests on the occasion were Professor Boyce, F.R.S., Dr. Arthur Evans and

Dr. H. H. Clarke. Professor Boyce stated that vigorous anti-mosquito measures in Bathurst had resulted in marked improvement in the health of both Europeans and natives. At Freetown also improvement was noted, due probably to the removal of the living quarters from the seat of infection. Residents should be encouraged to sleep in those districts where mosquitoes least prevailed. At Conakry, a town in French territory, malaria seemed to be increasing, in spite of excellent general sanitary arrangements, simply because the authorities had neglected to do away with or shut up the old wells in the city in which mosquitoes bred.

Translation.

CONTRIBUTION TO QUININE PROPHYLAXIS IN THE TROPICS.

By Hans Ziemann.
State Surgeon, Naval Staff Surgeon.

Official Report.

(*Reprinted from "Archiv für Schiffs und Tropen-Hygiene," vol.* vii., 1904. *Abridged and translated from the German by* P. Falcke.)

In obedience to the request of the German Government, I forward the results of my enquiries respecting the prophylactic use of quinine in the case of 164 persons. Only twenty of these persons were not under my care.

As a great many patients had relapses, the number of which could not be ascertained, the number 164 does not cover the number of attacks of fever, so it is actually considerably higher.

Only those patients have been chosen for these enquiries who have spent long periods in the Tropics, and particular attention has also been directed to those persons in whom blackwater fever has set in as a complication of malaria, in order to determine the influence of prophylaxis and non-prophylaxis.

To me the attraction for the enquiry was the greater because at one time there was a great aversion to quinine prophylaxis along the entire West Coast of Africa, and I was the subject of the derision of the laymen on account of my continued agitation for the introduction of quinine prophylaxis, as well as in consequence of the strict prophylaxis I exacted amongst the crew on board H.M.S. "Hyena."

The results showed the striking necessity for such prophylaxis. In one year in which a kind of pandemic of malaria prevailed along the entire West Coast, and during which there was great mortality, we had only 23·5 per cent. of sickness, fresh cases, and 8·14 per cent. of relapses; there was not one single death and no case of premature despatch home. In former years there had been 350 per cent. relapses. On their return home every one looked healthy and hearty, although both the officers and crew of the "Hyena" had been exposed to unfavourable conditions on land, and the quarters on board were lamentably bad. The plan I adopted was to administer 1 gram quinine every four days; if a person had stayed on land for several days 1 gram was given every three days, and after an attack of fever a temporary strict increased prophylaxis was ordered. Relapses were the exception.

The material for this enquiry has not been sifted out, but is chosen as occasion directed. It comprises nearly all the officials in Duala who have been stationed there over six months.

It must be borne in mind that, even amongst those reckoned as "regular prophylactics," at least 30 per cent. or 40 per cent. did not take the quinine with absolute regularity.

In order to meet the requirements of personal idiosyncrasy, I apply various methods of administering quinine, both as regards dose and period:—

(1) Every five days, 0·5 gram quinine (A. Plehn).

(2) Every five days, 1·0 g., either in such a manner, the four days without quinine intervened, or the drug is taken one, five, ten, fifteen, &c.

(3) Every four days, 0·5 g. of quinine to be taken (or 0·5 g. euquinine in sensitive persons).

(4) Every four days, 1·0 g. of quinine; 1·0 g. of euquinine with bromide of potash to minimise the tinnitus aurium and trembling of the hands.

It may be accepted as a general rule that, after every attack of fever, a few germs remain in the body, which come to maturity after two to twenty-four hours, causing a fresh access of fever. For various reasons, it will be found that the same prophylaxis applied to avoid relapses is also best adapted to prevent new attacks, and therefore quinine every four or five days is taken. In addition, in order to avoid relapses after an actual attack of malaria, 1 g. of quinine must be taken on three consecutive days, and for another fortnight 1 g. is given every alternate day. This was the drastic prophylaxis already introduced by me in 1894, and which I then added to my general prophylaxis.

No quinine should be given to children under one year old. Until that age malarial infection must be guarded against by protecting the infants from the attacks of mosquitoes, a matter that requires the greatest care. Children of from 1 to 2 years of age are given 0·1 g. euquinine or quinine in chocolate, those from 2 to 3 years of age receive 0·2; the healthy appearance of the children of the Basel Mission families demonstrates that these doses are not too large. Older children need not be considered in this connection, as hardly any family remains longer than three years in West Africa, and the children are left at home when the parents return.

As to blackwater fever patients, the process of treatment is similar to that after an attack of malaria. As soon as the hæmoglobinuria and albuminuria have disappeared, 1 decigram of quinine (or euquinine if quinine is badly borne) is given; the urine is carefully watched, and the dose increased by a decigram a day until the dose formerly taken is safely attained. The maximum dose is then given for three consecutive days; for a fortnight it is given every other day, and then the habitual prophylaxis is resumed. If albuminuria, or a darker colour of the urine be again observed, the quinine should be at once suspended till the symptoms have disappeared, when the treatment is recommenced

with 0·1 quinine and continued as above. The practitioner who, like myself, has seen albuminuria set in after only 4 milligrams of quinine, and has observed blackwater fever after 5 milligrams to 1 centigram of the drug, is in a position to comprehend the extreme caution necessary in the administration of the drug.

We shall now consider:—

I. The results of prophylaxis or non-prophylaxis in relation to the frequency of attacks of malaria in general.

II. The results of prophylaxis or non-prophylaxis in relation to the frequency of (*a*) attacks of blackwater fever, (*b*) the cases of death from blackwater fever.

III. The general total results arrived at by means of this enquiry.

I.—*The Results of Prophylaxis and Non-prophylaxis in Relation to the Frequency of Attacks of Malaria in General.*

I can actually eschew the mention of cases of death in consequence of malaria. A modern tropical practitioner should have no such cases in uncomplicated malaria if timely and correct treatment are adopted. I had only three cases of death from malaria tropica. In the first case the patient had succumbed to malaria apoplectica before the arrival of the doctor. In the second case the patient was found to be dying from the same cause on the doctor's arrival. In the third case, complicated with nephritis, the patient was a feeble, elderly man, who, it may be noted, had never taken quinine prophylactically. *I cannot too strongly emphasise the fact that attacks of malaria are infinitely more severe in persons who have never or rarely taken quinine or have taken it irregularly than in those who have regularly employed the drug as a prophylactic.* If such a complication as blackwater fever sets in, those who have not taken quinine succumb to the intercurrent disease much more frequently than those who have taken it.

A.—Results in persons who have never adopted quinine prophylaxis. (Total 25.)

Amongst these there were some persons who would not take quinine "on principle," even when threatened with fever. According to R. Koch, immunity should have been attained by these. In reality most of these persons were very anæmic men with pronounced splenic tumours and high evening temperatures. In one of these cases quinine carefully administered warded off blackwater fever, from which the man had once suffered before he took quinine. In this case the minutest doses of quinine were given, and the dose gradually increased, till the condition improved materially, and the patient was sent home.

Of these 25 persons, 24=93 per cent., suffered frequently and severely from fever. One apparently had no fever, but looked miserably ill, and evidently, according to accounts, had suffered from latent fever; 9 died=36 per cent.; 8 invalided home=32 per cent; 3, who took quinine only when they had fever, are healthy=12 per cent.

There is no need to enlarge on these figures, which prove that without prophylaxis 100 per cent. of the white population in Cameroon would run the risk of being attacked with fever.

B.—Results in persons who took quinine irregularly as a prophylactic. (Total 70.)

Amongst these are comprised those who from the start took quinine irregularly, or at first took none, and later on took it regularly or irregularly, or finally those who took it regularly at first, next irregularly, and finally took none.

Results.—Of 70 persons taking quinine irregularly, 47 are now healthy=67·14 per cent. (of the non-prophylactics only=12 per cent.); 1=1·43 per cent. remained free from malaria. In 26 cases=37·14 per cent., the introduction of a regular or increased prophylaxis caused the fever to cease entirely. In 21 cases=30 per cent., the fever decreased considerably. Thus in 47 cases=67·14 per cent., improvement or relative recovery after the introduction of regular prophylaxis. In 8 cases=11·43 per cent., the fever increased, and the general condition became worse after the cessation of the prophylaxis.

Six cases=8·57 per cent. (non-prophylactics=37 per cent.), died of blackwater fever; these at first took no quinine, and afterwards only took it irregularly; 6=8·57 per cent. (in the non-prophylactic=32 per cent.), invalided home in consequence of blackwater fever or chronic malaria.

Thus 20=28·57 per cent., prematurely died or were sent home (of non-prophylactics=68 per cent).

Perhaps these results are still more instructive than those relating to the regular prophylactics or to those who took no quinine at all, as the relinquishment of the prophylaxis is almost always accompanied by increased fevers, and partly by complications such as blackwater fever. The commencement of increased or regular prophylaxis promptly brings about a remarkable decrease of fever.

It is only in isolated cases when the quinine has been taken irregularly, or only at times, that the chronic malaria does not cease when the regular or increased prophylaxis has been adopted.

C.—Results in regular prophylactics and those who have always practised it. (Total 69.)

Of 69 regular prophylactics, 11 were never ill=16 per cent. (of the 70 irregular prophylactics only 1 was healthy = 1·43 per cent.; of the 15 non-prophylactics, all were ill.)

16 = 23·2 per cent. of the regular prophylactics only suffered from slight fever.

17 = 24·64 per cent. lost the fever entirely after the introduction of a still more drastic prophylaxis added to the regular prophylaxis; the increase being either in regard to period or dose, as the case might be.

5 = 7·25 per cent. became much less subject to fever after the introduction of a more drastic regular prophylaxis.

62 = 89·87 per cent. remained healthy and capable of service in the Tropics (of the irregular prophylactics, only 67·14 per cent.; of the non-prophylactics, only 12 per cent.).

3 = 4·35 per cent. died of blackwater fever (of irregular prophylactics, 8·57 per cent.; of non-prophylactics, 36 per cent.).

2 = 2·89 per cent. were invalided home in conse-

quence of blackwater fever (of irregular prophylactics, 0·57 per cent.; of non-prophylactics, 32 per cent.); 2 = 2·89 per cent. look pale and languid.

II.—*Results in Prophylaxis or Non-prophylaxis in Blackwater Fever.*

It may be mentioned that ten persons who came under treatment for blackwater fever cannot be included in this report, as through some mischance their history of disease was lost. Had it been otherwise, the material would have been larger. However, my 62 cases are sufficient for the purpose.

(*a*) Results in non-prophylactics amongst blackwater fever patients:—

(1) 14 blackwater fever patients of the 15 who did not take quinine prophylactically suffered from malaria preceding the attacks of blackwater fever.

(2) These 15 patients had a total of 35 attacks, the average being thus 2·33 attacks to each.

(3) 7 = 46·66 per cent. died.

(4) 5 = 33·33 per cent. were invalided home. Of the three remaining the ultimate history is unknown.

Of the 7 who died, 2 did not succumb direct to blackwater fever, 1 dying of a subsequent pleuritis, and the others of hepatic abscess.

(*b*) Results in irregular prophylactics amongst blackwater fever patients:—

(1) The 35 blackwater fever patients who had taken quinine irregularly all had attacks of malaria, more or less frequent, before the first access of blackwater fever.

(2) These 35 men had between them 83 attacks of blackwater fever, making an average of 2·37 attacks each. (This number almost corresponds with the number 2·33 of the non-prophylactics.)

(3) 19 = 54·3 per cent. are healthy and capable of service in the Tropics (of the non-prophylactics almost all are sick or dead).

(4) 6 = 17·14 per cent. died from blackwater fever (of the non-prophylactics, 46·66 per cent. died).

(5) 5 = 14·29 per cent. were invalided home.

(6) The half-gram prophylaxis had no distinct influence on the origin of blackwater fever in this group of patients. First of all, they had all either taken quinine irregularly from the start, or not at all at first, and then regularly or *vice versa*. In 16 cases, 0·5 or 0·6 had been taken about every four, five or six, seven or eight days, irregularly. In other cases sometimes 0·5, sometimes 0·8 or 1·0, had been taken every five days, or at more distant intervals. In one case blackwater fever had set in during a period in which 1·0 had been taken every ninth and tenth day. In one case blackwater fever set in before the introduction of any prophylaxis whatever; in two other cases, during furlough after discontinuation of the prophylaxis.

C.—Results in regular prophylactics amongst blackwater fever patients.

(1) Of 12 blackwater fever patients who had regularly taken quinine all had suffered from malaria more or less frequently before the first attack of blackwater fever.

These 12 patients numbered 19 attacks between them, this being an average of 1·5 attacks each, as compared with 2·33 in the non-prophylactics and 2·37 in the irregulars. In 2 patients who habitually took 0·5 quinine every five days the single attack each had was very slight.

(2) 8=66·66 per cent. recovered, and were capable of service in the Tropics (of the irregular prophylactics only 54·3 per cent., in the non-prophylactics none).

(3) 3=25 per cent. died (of the irregular prophylactics 17·14 per cent., of the non-prophylactics 46·66 per cent.).

(4) 1=8·33 per cent. were sent home (of the irregular prophylactics 14·29 per cent., of the non-prophylactics 33·33 per cent.).

(5) This group also does not afford a correct standard from which to defend the half-gram prophylaxis. Of the 12 regular prophylactics, 6 had presumably taken 0·5 quinine every five days, 3 had taken 0·5 for a time and 1·0 for a time. One had taken 0·5 every Wednesday and Saturday; one had taken first 0·5 every fifth day, and afterwards 1·0 every seventh and eighth day; one patient was exceedingly regular, having at first taken 1·0 every ninth and tenth day, and then every fourth and fifth day; one man was attacked with blackwater fever during the 1 g. prophylaxis: and one only developed an attack during his furlough, when he interrupted his regular prophylaxis; 8 patients were attacked with blackwater fever during a period when they were taking 0·5 quinine every five days.

III.—*The General Total Results Arrived at by Means of this Enquiry.*

The two tables require no comment; even in the one showing blackwater fever cases the results of regular prophylaxis are clearly observed. Particular attention may, however, be directed to the following points:—

(1) In a fraction of the cases—*i.e.*, in 16 per cent. of the regular prophylactics—the outbreak of fever was avoided, whereas only one was saved of the irregular prophylactics, and none of the non-prophylactics escaped.

(2) In a percentage of 23·2 regular prophylactics there was only one attack of very slight fever; in another 24·64 per cent. of regular prophylactics, the attacks of fever disappeared entirely on the introduction of a more drastic prophylaxis.

(3) That the large proportion of 89·87 per cent. of the total regular prophylactics remained capable of service in the Tropics, that 67·14 per cent. of the irregulars remained fit for service, and only 12 per cent. of the non-prophylactics were in good health.

(4) That attacks of fever were slighter and of shorter duration in the regular prophylactics.

(5) That regular prophylactics had infinitely better standing as regards sickness and death.

Even these results will doubtless become still more favourable when more drastic prophylaxis has gained a more general footing, though it must be noted that quinine alone affords no absolute protection.

* * * * *

The author, during his experiments in Victoria in 1900, was frequently bitten by Anopheles artificially

Table of all Cases Observed.

Total of all cases observed	Number	Persons remaining free from malaria		Persons remaining capable of service in the Tropics		Deaths from blackwater fever and other consecutive diseases		Invalided home in consequence of disease		Attacked with blackwater fever		Died from blackwater fever alone	
		Absolute.	Per cent.	Absolute.	Per cent.	Absolute.	Per cent.	Absolute.	Per cent.	Absolute.	Per cent.	Absolute.	Per cent.
Non-prophylactics ..	25	0	0·0	3	12	9	36	8	32	15	60	7	28
Irregular prophylactics ..	70	1	1·43	47	67·14	6	8·57	6	8·57	35	50	6	8·57
Regular prophylatics ..	69	11	16	62	89·8	3	4·35	2	2·89	12	17·4	3	4·35
Total ..	164	12	7·32	112	68·3	18	10·97	17	10·36	62	57·8	16	9·76

Table of Blackwater Fever Cases only.

Blackwater fever patients	Number	Blackwater fever preceded by attacks of malaria		Total number of attacks of blackwater fever		Capable of continuing service in the Tropics		Deaths from blackwater fever alone		Invalided home		Further history unknown	
		Absolute.	Per cent.	Absolute.	Per cent.	Absolute.	Per cent.	Absolute.	Per cent.	Absolute.	Per cent.	Absolute.	Per cent.
Non-prophylactics ..	15	very many	—	35	2·33	0 (?)	0 (?)	7	46·66	5	33·33	3	20·
Irregular prophylactics ..	35	many	—	83	2·37	19	54·3	6	17·14	5	14·29	5	14·28
Regular prophylactics ..	12	a number	—	19	1·5	8	66·66	3	25·0	1	8·33	—	—
Total ..	62	—	—	137	2·2	27	41·93	16	25·8	11	17·74	8	12·9

infected ; he nevertheless never suffered from malaria, he always took 1 g. quinine every four days, and when working in malarious swamps took it still oftener. He, however, does not consider this fact to be an indisputable proof of the absolute efficacy of the quinine prophylaxis. This drug, however, cannot be too highly prized in the fight against malaria. Its efficacy has been strikingly demonstrated in many cases in one of the worst malarial districts in the world. The ideal requisition with which to encounter malaria is, and always will be, the combination of all the remedies furnished by modern tropical hygiene. Malaria amidst the fluctuating population of West Africa cannot possibly be combated by quininisation alone. What can be done is constantly to issue teachings on the being, treatment, and prevention of malaria to all the whites and to the intelligent blacks. The pupils in the advanced classes in schools should be instructed in hygiene as applied to dwellings and clothing, food and drink. All swamps should be drained, a sanitary brigade organised to pour saprol (?) into all the pools. The author has opened the campaign in West Africa by these means. It is interesting to observe how more and more clean native dwellings are being erected, with windows that admit light and air, and afford no shelter to the Anopheles.

The vanity of the Negroes, who, whenever possible, endeavour to do the same as the whites, may be advantageously used for their good. We must not forget that the fight against malaria is also a question of money.

It will be a matter of patience, however, to force malaria more and more into the background, as it has been with alcoholism here in Duala, this vice being one of the worst enemies of the European in the Tropics.

PURULENT PERITONITIS PERFORANS AND ASCARIS LUMBRICOIDES IN A NEGRO.

Translated by P. Falcke.

Dr. Hans Ziemann (*Archiv für Schiffs und Tropen-Hygiene*, 1905, vol. ix.) reports the following interesting case: During the author's tenure of office in Cameroon a dying negro boy was brought to him. He was informed that the lad had always enjoyed good health, and until the previous day had had a good appetite. Only four hours previous to his admission he had been taken with severe abdominal pains, which caused him to twist and squirm; he also had several attacks of vomiting. Dr. Ziemann examined the lad immediately on his admission to hospital. He was a powerfully-built boy of about 12; temp. 38·9° C.; pulse accelerated and weak, 140 per minute ; abdomen tense, distended and very sensitive. Death supervened after only a few minutes, and an obduction was at once performed, showing a fresh purulent fibrinous exudation in the abdominal cavity. The loops of the intestines adhered to one another and were injected. Two large *Ascaris lumbricoides* and some fæcal matter were found between the loops of the small intestines, and a careful examination revealed two circular smooth

holes corresponding in size to the worms in the walls of the small intestine in the middle part of the ileum. The intestines, on being opened, were found to contain an incredible number of ascarides along the entire course, but which were most numerous in the ileum. It was impossible to compute the number of worms, but they filled four measures of one litre each. There was no trace of ulceration either in the vicinity of the holes or elsewhere. The whole of the mucous membrane of the intestine, however, was hyperæmic. The author is of opinion that in this case the holes were caused by the boring of the worms, and that the escape of the fæces into the abdominal cavity set up the purulent and exceedingly acute peritonitis. The author states that he has never heard of a similar case in the Tropics. The "Kroo" Negroes, of which this lad was a member, are of a suspicious and revengeful nature, and attributed the lad's sudden illness to an attempt of some enemy to poison him. The obduction which his friends permitted dispelled this illusion, and probably prevented subsequent unmerited vengeance being wreaked on some suspected person.

Notes and News.

MEDICAL VISIT TO PARIS.—A party of British medical men have been invited to pay a visit to Paris on May 11th to visit the hospitals and other medical institutions in that city. Sir William Broadbent is the chairman of the London Committee, and applications to join the party may be forwarded to him.

H.R.H. PRINCESS CHRISTIAN has been made Honorary President of the Liverpool School of Tropical Medicine.

MESSRS. BURROUGHS, WELLCOME AND CO. have been given a Grand Prix—the highest award—at the Cape Town International Industrial Exhibition for the pharmaceutical and other products exhibited by them.

New Drugs.

HISTOGENOL, "HALMÉ," an organic arsenio-phosphoreted compound, is recommended in the treatment of phthisis and wasting diseases generally. The drug is presented in three pharmaceutical forms: emulsion, granulated form, and as bulbs.

Remedies.

INSECT BITES.—After applying aromatic spirit of ammonia freely to the bitten part, apply a lotion of liq. plumbi subacetatis and tincture of opium āā ʒ ss. to ʒ viii. distilled water.

INTESTINAL FERMENTATION. — Bismuth salicylat.; benzonaphthol, sodii benzoatii, āā 45 gm.; syrup simpl. ʒ v., and aquæ ad ʒ iv. One teaspoonful every three or four hours.—Dr. F. GROSSE, *Medical Review of Reviews*.

Medical News.

THE PLASMŒBA OF DENGUE. — Eberle, H. A., a U.S. Army surgeon engaged in the Philippines, states that he has discovered the cause of dengue to be a parasite belonging to the sporozoa, occurring in the blood plasma. Eberle describes the parasite as occupying the cells, producing a pale violet-tinted growth of various shapes. Spore formations occur, occupying usually two-thirds of the entire corpuscle. Spores from pseudopodia, which project beyond the border of the corpuscle, pushing out the elastic limiting membrane of the cell, and finally burst into the plasma. There is much in the description which requires the acceptation of this discovery with extreme caution.

DR. A. LINGARD, Imperial bacteriologist at the Muktesar Laboratory, India, has isued a valuable report on the preparation of rinderpest protective serum.

The Destruction of Mosquitoes.

IN a letter to the Editor of the West India Committee Circular, C. K. Gibbons remarks: In your allusion to the pamphlet by Major W. M. Hodder, R.E., you say "the fact that Barbados, although it has swamps and the mosquitoes might be imported, is free from the *Anopheles* and also malarial fever, leads the writer to say that if the reason for this could be discovered, a much more simple and efficacious means of destroying the insect would be at hand than the costly and laborious method of drainage, clearing. and other works." I have no doubt that the swamps and ponds in Barbados are kept free from mosquitoes by a small fish that abounds in them. They are very small, a full-grown female being about one and a quarter inches long and the male about three-quarters of an inch, but exist in such shoals that they are known locally as "millions." As a child I have often kept them in an aquarium, and found out that their favourite food was the larvæ of the mosquito, on which I used to feed them, and I now always keep them in my water tanks in Barbados, which without them would team with the larvæ of the local mosquito, which variety, though it does not spread malarial fever, has other objectionable habits. These interesting little fish are viviparous, and the male is most gallant to his mate, circling round her and bending his tail backwards and forwards, no doubt with the object of showing off his brilliant markings of red, green, gold, and black, which she does not possess. The natural enemies of the "million" are the golding – every pond has its solitary fisher—and the voracious larvæ of the dragon-fly. I suggest that the "million" be imported in the malarial swamps in the other West Indian islands and Demerara, where they may meet with enemies too numerous to allow them to increase, but the experiment is worth the trial.

ABBAZIA, a seaside resort on the east coast of Istria, is well spoken of as a winter resort. Sea-bathing in the Adriatic and the walks in the surrounding hills are the special attractions.

THE annual dinner of the Cairo School of Medicine was held on January 26th. The occasion was rendered of additional interest by the fact that Dr. Symmers, who has long been connected with the School, was presented with a handsome silver bowl by his colleagues on the occasion of his leaving Cairo to take up the duties of Professor of Pathology in the Queen's University, Belfast. Mr. Reginald Harrison, who was travelling through Cairo, was also present at the dinner, and advocated a closer connection between the School of Medicine in Cairo and educational and licensing bodies in Britain.

THE CULTIVATION OF LIQUORICE IN MESOPOTOMIA.—Major Newmarch, British Consul-General at Baghdad, in a despatch to the Foreign Office, gives interesting particulars of the liquorice industry in Mesopotamia. The *Glycyrrhiza glabra* plant, from which liquorice is obtained, grows at various places on the banks of the Tigris and Euphrates Rivers. The plant attains usually a height of from 4 to 5 ft., but in very favourable soil it may grow from 8 to 10 ft. high. It thrives best in moist lands near rivers, and prefers a rich soil. The root of the plant is cured and pressed into bales for export. Some 5,000 persons are employed in the industry, and about 10,000 tons are exported annually, the average value being about £5 per ton. Winter, when the leaves have fallen and the plant is resting or "down," is the period during which the root yields the best liquorice.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"The Liverpool Medico-Chirurgical Journal," January, 1905.

The Treatment of Some Cases of Malarial Fever. By Wm. Carter, M.D.

Carter strongly advocates Warburg's tincture in cases of recurring malarial fever.

"British Medical Journal," February 4, 1905.

1. A Case of Trypanosomiasis. By W. I. Taylor and John Currie, p. 248.

2. Mode of Infection of Human Tick Fever. Letter, p. 280.

(1) Taylor and Currie describe a case of trypanosomiasis which they observed in the Colonial Hospital, Lagos. The patient, aged 32, was a native of Ibadan, a large town 120 miles inland. In 1901 he went to Calabar, where he served as a policeman. He reached the hospital on November 7th, 1904, when he presented a staggering gait, a stupid mental condition, and responded to questions in a childish manner.

He was in a fairly well-nourished condition; the breath smelt fetid, but his respiratory, circulatory and digestive functions were normal; the liver was slightly enlarged, and the spleen markedly so; the skin showed no rash, nor were the lymphatic glands markedly enlarged; his nervous system showed neither ataxy nor loss of co-ordination of muscles; knee-jerk and toe (flexor) reflexes somewhat exaggerated; no ankle clonus; sensation normal; no muscular wasting. Thirty-seven days after admission (December 15th) the patient was drowsy, but easily waked; face puffy and expressionless; cervical glands distinctly enlarged; a circular patch of scaly eruption on the left side of the neck; no fever. The examination of the blood on November 10th showed trypanosomes in peripheral blood, 4 to the film. *Filaria perstans* present. Blood count gave: Red corpuscles, 2,530,000 per c.mm.; slight poikilocytosis; white corpuscles, 6,000 per c.mm.; lymphocytes, 36·8 per cent.; mononuclears, 11·2 per cent.; eosinophiles, 8·4 per cent.; hæmoglobin, 32 per cent. On November 16th lumbar puncture was performed, but no trypanosomes found. Punctures of the spleen and liver gave films in which occurred bodies resembling those described by Rose, Bradford and Plummer as occurring in cases of *Trypanosoma brucei*. On December 16th no trypanosomes found in finger blood, but *Filaria diurna* and *F. perstans* present. On December 31st cerebro-spinal fluid showed trypanosomes. The absence of fever in this case is notable. It should be mentioned also that sleeping sickness is not endemic in Lagos.

(2) Major Ross mentions that a telegram from Drs. Dutton and Todd, who are engaged in research work in the Congo Free State, has been received announcing that "Spirilla cause human tick fever; naturally infected ornithodorous infect monkey."

"Medical Record," December 24, 1904.

The Antitoxin Troatment of Tertian Malarial Infections. By JOSEPH H. FORD.

The chief purpose of these investigations was the discovery of an agent which, when injected, will confer temporary or permanent immunity. Certainly, the discovery of a specific antitoxin is a long step in that direction, and Ford has reason to hope that we here possess the key which will unlock the Tropics. The animals employed in these experiments were rabbits, the domestic white rabbits being most suitable for the purpose. The rabbits were inoculated by the intravenous injection of human blood, in which the *Plasmodium malariæ* had been found, and by the bites of *Anopheles maculipennis* and *A. punctipennis*.

Experiment 1.—The first case of malaria which I sought to cure by antitoxin treatment received 0·75 gm. of serum obtained from a brown rabbit. This was injected subcutaneously twenty-three hours before the expected chill. The fever, however, recurred.

Experiment 2.—Defibrinated blood, 1·50 grammes, was injected subcutaneously into a patient suffering from benign double tertian malaria. Fever recurred.

Experiment 3.—Defibrinated blood, 2 grammes, was given at one injection; fever recurred, but when a second injection of 1½ grammes was injected the fever disappeared permanently.

Experiment 4.—Defibrinated blood, 1½ grammes, and the same quantity repeated, fever disappeared.

Experiment 5.—The same quantities and the same results obtained as in Experiment 4.

Experiment 6.—Desiccated erythrocytes and serum

pulverised and kept for use in sterile tubes were tried, 1½ grammes pulverised and desiccated red blood corpuscles were suspended in 5 grammes of isotonic salt solution. An abscess developed at seat of injection which caused an elevation of temperature; when the abscess was relieved all feverish symptoms disappeared.

Experiment 7.—One gramme of desiccated erythrocytes suspended in 4 grammes normal salt solution gave same results as in Experiment 6, the malarial parasites disappearing from the blood.

Experiment 8.—Desiccated serum ½ gramme in solution 4½ grammes of serum; no effect.

Experiment 9.—Desiccated serum 0·75 grammes in 4 grains sterile water were injected hypodermically; no parasites were found in the blood after the third day.

Dr. Ford concludes that desiccated erythrocytes, containing the malarial antitoxin, will find their chief usefulness in injections given to confer immunity, and it is possible that we will find the corresponding serum, in much larger doses, more suitable for curative purposes.

"Medical Record," January 21st, 1905.

1. A Contribution to the Etiology of Malaria, and to the Analysis of Some Relations of Meteorology to Chemical Pathology. By H. Wakefield, M.D.
2. The Use of Sulphate of Copper Alone, and in Combination with Lime, for the Destruction of Mosquito Larvæ, as a Deodorant, and as a Disinfectant. By A. H. Doty, M.D.

(1) Wakefield states that the purpose of this paper is a protest against these undue excesses of speculative conclusion which, like all fads, are the consequence of an unwarranted drift of opinion, and are unworthy of a scientific profession. The following fragmentary collation on malaria is humbly submitted as a nucleus of evidence in behalf of my contention that malaria is a syndrome, more typical in symptomatology than in the incidental blood change, or in a specific mode of infection. Moreover, that it is essentially a disease of general stasis of catabolism, involving primarily blood destruction, and is, in different cases, caused by the suboxidation of humid, vitiated atmospheres, &c., by toxicity, of many mosquito bites, by intravascular bacterial toxins, and undoubtedly, also, by direct inhalation of atmospheres heavily impregnated with decaying organic matter, which is absorbed by the blood circulating through the pulmonary alveoli. The symptologic syndrome of the disease is essentially one of subcatabolism, and is largely due to some form of vitiated air; the newly discovered factors, the *plasmodium* and the mosquito, should be relegated to the subordinate position of contributory factors, instead of adopting the absurd and confusing custom of revising our conceptions of a disease *per se*, whenever a new factor is proved or accepted as bearing an etiologic relation, which, owing to ignorance of underlying etiologic actions, we have been unable to reconcile to our preconceptions of the resulting syndrome.

(2) Doty experimented with three solutions in his endeavour to ascertain the best means of destroying mosquito larvæ, and of disinfecting and deodorising foul water in tanks. The solutions were: Sulphate of copper, 1 lb. to 10 gallons water; lime, 1lb. to 10 gallons water; sulphate of copper and lime, of each 1 lb. to 10 gallons water.

He finds the mixture of lime and sulphate of copper more effective than when either are used alone. The mixture has no toxic effect on the larva, but kills them by rapidly removing from the water the organic matter upon which the larvæ live.

"Indian Medical Gazette," December, 1904.

1. Further Notes on the Treatment of Leprosy by Injections of Leprolin. By E. R. Rost, Capt. I.M.S.
2. A Short Account of the Various Trypanosomata Found to Date in India in the Blood of some of the Lower Animals and Fish. By A. Lingard, M.B.
3. The Paternal *versus* the Common-sense Plague Policy. By W. G. King, Lt.-Col. I.M.S., C.I.E.
4. Plague in Ferozepore in 1904. By L. B. Scott, Lt. I.M.S.
5. Guaiaquin: A Remedy suggested for Piroplasmosis, Kala-azar, and other Allied Fevers. By M. C. Nanjunda Row, M.B.
6. Case of Elephantasis of the Penis. By H. Innes, Capt. I.M.S.
7. The Lathyrism Inquiry: Editorial.
8. Anti-malarial Sanitation in India: Editorial.
9. Burning Foot, or Erythromelagia Tropica: Note.
10. Animals and Plague Infection: Note.
11. The Tyrol as a Health Resort for Anglo-Indians: Note.
12. Successful Use of Solution of Adrenalin Chloride in Plague and Asthma. By T. Bahadurji.
13. Surgical Procedure in Liver Abscess. By W. Huntly, M.D.

(1) Rost prepares a solid extract of beef: he uses one ounce of beef dissolved in two oz. water and soaked in pumice stone, previously cleaned and dried, placed in bottles inside the autoclave. One ounce of this extract will give 2,000 cc. of nutrient fluid, on which the acid-fast bacteria grows readily, and the leprosy bacillus gives a culture capable of reducing to leprolin in from six to eight weeks in this medium.

The best way of making a nutrient solid medium for growing the bacillus of leprosy is to dialyse the agar cut into thin strips by merely allowing them to soak, in frequently changed distilled water, for from two to three weeks, at the end of which time the agar is melted and tested for chlorine. At the same time the nutrient broth is dialysed through parchment paper for a similar length of time, and when all traces of chlorine are absent, the two are mixed together, and the solid nutrient medium made.

Rost cultivated the bacillus of leprosy from the cotton shirt of a leper, and even when strips of the shirt were hung in distilled water the bacilli were found after one month in the water in easily recognisable quantities. If cotton-wool is added to the medium in flasks, and the cultivation examined in about one month, the bacilli will be found in groups inside the cotton fibres. Rost considers this very important, as it shows a possible means of contracting the disease, especially as we know the bacillus will grow in distilled water, and so a shirt soaked in the rain and kept damp on the body, if already infected, could easily be a source of infection to

the wearer, especially if he should have some small abrasion, such as a prickly heat scratch.

Leprolin has been tried in Burma, where fourteen cases of leprosy are reported to have been cured by the treatment.

Rost has himself given 1,000 injections in Rangoon and Mandalay with no bad constitutional effects, and in nearly all the cases has improvement resulted.

The return of sensation to anæsthetic parts of the skin by the use of the injection has been most marked and wonderfully speedy, justifying the belief that the action of leprolin is not an auto-antitoxic, but an antitoxic agency.

The dose of leprolin, and the interval at which it should be injected, varies; the difficulty in producing a leprolin of constant strength makes it imperative to increase the dose if it is not found to cause a reactionary fever of over 100° F.

The injections were made chiefly in the buttock or the back, and the dose varied from 10 m. to 60 m., and might be given on successive days for as many as six times, but cures were effective after two or three doses only.

Rost reports fourteen cases as completely cured.

(2) Lingard, Imperial Bacteriologist to the Government of India, gives an account of eight trypanosomes met with in India. (1) *Trypanosoma Lewisi*, discovered in 1877 by T. Lewis in rats. (2) *T. Evansi*, discovered in 1880 in equines, mules, and camels by Griffith Evans. (3) Giant Trypanosoma of bovines, discovered by A. Lingard in 1892. (4) Trypanosoma of fish, described by A. Lingard in 1891-93. (5) *Trypanosoma bandicotti*, discovered in the blood of *Mus giganteus* in 1893 and in bandicoots. (6) Trypanosoma of Plains bovines, discovered by A. Lingard in bullocks in 1895. (7) Trypanosoma of hill cattle, discovered by A. Lingard in 1902. (8) *Trypanosoma equiperdum*, discovered by Pease in 1902.

(3) King contributes an excellent criticism upon a series of articles which have lately appeared in the *Pioneer* by "Red Cap," who advocates a "common-sense policy" of treatment for plague. "Red Cap" trusts to the people's common-sense coming to their rescue when they have been bitterly punished as a result of their ignorance. The principle appears to be, "let plague have full play until necessity compels the suffering community to take steps for its amelioration." No period is assigned for the termination of these "educational measures." Meantime the people die.

King remarks that experience will show that the common-sense policy of uncontrolled plague is a very expensive luxury for a community to indulge in if they depend upon trade for their living, or for a Government if its existence depends upon finances derived from taxation. Plague cannot be got rid of by pursuing the policy of the ostrich. It is a disagreeable matter that must be tackled, and the sooner and more completely it is met on correctly organised lines the better for the financial welfare of India. Prejudices and conservatism not only of the people of the country but also of many highly educated members of the European community will delay the consummation, and many futile compromises will accordingly be attempted by the various local governments; but it takes no gift of prophecy to foretell that ultimately the necessity for the formation of a properly organised and equipped permanent public health service for India which shall grapple with preventible diseases must be recognised.

(4) Scott concludes from observations of plague in India that the muridæ are the sole definitive hosts of plague, and that their offices as hosts, but those of no other animal, are essential to the survival of plague in nature; its ability to infect the bodies of man and other animals being due to an accidental resemblance of their bloods to that of the muridæ in the absence of some plague-resisting element.

Furthermore, plague is probably dependent almost entirely upon the *domestic* muridæ, in whose conditions of life dirt and darkness favour the survival of infection for long periods in their homes outside the animal body, and crowding, permit of rapid spread of infection from individual to individual.

Hence, apart from the offices of host, man is manifestly of much importance in the existence of plague, in that the domestic rat and mouse depend on him for their existence, and in that he acts as the chief transporter of infection to fresh communities of muridæ along lines of human travel in contaminated articles and otherwise.

Prevention of Plague.

If this view of plague be correct, the following corollaries as to prevention need no proof:—

(i.) *Precautions Against Human Infection.*—Live in a house free of rats and mice and one which will not preserve infection in floors, &c., should it gain admission. When plague has entered a house or village, flee from infected houses and diseased rats and mice, and shun all objects which may have come in contact with them.

Before reoccupation be sure that there are no more diseased rats and mice, and that houses, &c., are disinfected by unroofing or otherwise.

(ii.) *Suppression of the Disease.*—This resolves itself into prevention of spread, since, if confined to small localities, plague must die out from want of fresh hosts. Segregation of human contacts and isolation of human patients can be of no more use towards checking plague than they would be towards checking anthrax. As just explained, they may prevent the occasional production of adventitious virulence of plague towards man.

Inoculation, too, can (in my opinion) be of no use as a suppressive measure when applied to man. Anthrax inoculation, though very successful in producing immunity, is not applied to man, but to cattle. For this purpose plague inoculation should be similarly applied to rats and mice. We might as well hope to suppress small-pox by vaccinating cows as to suppress plague by inoculating man.

Disinfection or absolute exclusion of articles coming from rat-infected places is of the greatest importance. Seeing that a human case may start rat plague in a fresh locality, quarantine of man and detention of plague-stricken travellers have some importance.

The essential measures are those applied to rats and mice. The chief must be wholesale destruction, since it is difficult to see how sanitation can be applied to these animals beyond so far as possible preventing

the access to them of imported infection. Japanese experience aids this conclusion, as in four Japanese cities in which plague had prevailed for years, a short application of a general destruction of rats arrested the disease.

(5) Row, M. C. Nanjunda, has been trying guaiaquin, a compound of guaiacol and quinine, in some cases of malarial cachexia (piroplasmosis). The dose of the drug was usually 4 grains four times daily. Row reports favourably of the drug in many cases.

(6) Innes removed the hypertrophy tissues from the genitals of a Hindu male patient, aged 26, at Bhagalpar Hospital. The penis was markedly in a state of elephantiasis, whilst the scrotum was in the state of lymph scrotum merely. The man had a hard chancre two years previously. No blood examination was obtained.

(7) The inquiry into the prevalence of lathyrism in the Central Provinces, which was determined upon in 1903, has just been reported upon. Andrew Buchanan, M.D., Major I.M.S., was entrusted with the inquiry. The report confirms the opinion that the vetch, *Lathyrus sativus*, termed *Teora* in the Central Provinces and *Kesari* in Northern India, is the cause of the disease. Previous reports are referred to: Sleeman's *Rambles and Recollections* in 1833, in the United Provinces; Kirke's account of the disease in Sinde in 1845; Irving's report in the *Annals of Indian Medical Science* in 1857. To cause lathyrism the grain of the lathyrus must be consumed for two or three months consecutively. The scarcity of wheat in the districts of the Central Provinces, where the disease prevailed, lasted from 1896 to 1902, and in the five districts, Hoshangahad, Narsingpur, Jubbulpore, Damoh and Saugar, chiefly affected, 7,492 persons were attacked, 5,775 being males, 759 females, and 958 children.

The cultivation of the lathyrus was prohibited in Europe in 1671, and in Algeria and at Allahabad during the latter part of the nineteenth century. In the Central Provinces of India, however, the grain of lathyrus is not only allowed to be issued to cattle, but also to farm servants. The wisdom of issuing the grain even to cattle is doubted by the editor of the *Indian Medical Gazette*, for in a footnote he suggests that the disease in horses known locally as kumri or "gone in the loins" may be due to the consumption of lathyrus grain.

(8) The failure of the Mian Mir measures against malaria which were discussed at the meeting of the British Medical Association at Oxford, in July, 1904, is the subject of an editorial in the *Indian Medical Gazette*. The causes of the failure are summed up as follows: (1) The antimalarial measures at Mian Mir were attempted on a scale inadequate to the magnitude of the evil. (2) It was a mistake to treat only one portion of the cantonment, as the whole station is one, and is subject to the same influences. (3) Irrigation is a necessity. What is wanted is an inquiry into the distance at which irrigation can be allowed in the neighbourhood of all cantonments and civil stations without detriment to the public health.

"Le Caducée," February 4th, 1905.

Médecine sanitaire maritime; Prophylaxie et traitement de la Fièvre Jaune (Maritime Sanitary Medicine; Prophylaxis and Treatment of Yellow Fever). By Dr. J. Dupuy, of Saint-Nazaire.

These are briefly some of the prophylactic measures to be enforced against yellow fever, as ordered by the special regulations drawn up by the Sanitary Convention of the Eastern States of South America.

I.—Maritime Prophylaxis.

Ships infected with yellow fever will be treated as follows:—

A. Ships calling at other Brazilian ports.

(*a*) The sick to be at once disembarked and isolated under suitable mosquito nets.

(*b*) The systematic destruction of mosquitoes to be carried out throughout the entire ship.

(*c*) Passengers disembarking at the port will receive a passport and will remain under sanitary supervision for thirteen days.

(*d*) The ship will then be allowed to clear, on taking on board a maritime sanitary inspector who will accompany the ship as far as the last Brazilian port. His duties are: (1) To make a daily inspection of the passengers and crew, at once isolating under a mosquito net any person showing feverish symptoms; (2) should he see any mosquitoes a fresh destruction is to be carried out.

B. Ships not calling at other Brazilian ports.

The instructions noted under *a*, *b* and *c*, as above, will be carried out.

C. Precautions against yellow fever on board the ship itself.

(*a*) Protection of the ship at anchor against the invasion of mosquitoes.

(1) Posting up in the crews' quarters a notice about the transmission of yellow fever and of malaria by mosquitoes.

(2) The issue of a mosquito net to each of the crew.

(3) The issue to those on watch at night of thick gloves and gauze veils for the protection of their hands and faces.

(4) Protection of all on board by inserting in all openings, port-holes and internal doorways, movable frame-work with metal trellis-work.

(*b*) Extermination of mosquitoes on board. This is to be carried out by the Clayton system, or other culicidal fumigation.

II.—Terrestrial Prophylaxis.

This in special hospitals is practically the isolation of the patient under a mosquito net, the object being to prevent infection of any Stegomyia mosquitoes present. It would be difficult to devise a more all-round useful contrivance than the portable isolating chamber of Dr. Marchoux.

In private houses the sick are at once to be placed under a mosquito net and afterwards transferred to a suitable room (selected by the family), which is first disinfected of mosquitoes and then rendered mosquito-proof; the patient is then at liberty to receive friends, if he wish. Insecticides, such as pyrethrum or sulphur, are then to be burnt in all the other rooms of the house in order to destroy any mosquitoes which may have bitten the patient. The chief request of the sanitary authorities is that they be informed at once of the occurrence of a case of yellow fever, as

the first four days of sickness are those on which mosquitoes are liable to take the germ of yellow fever to transmit it to other persons.

In spite of the excellent results everywhere obtained by the special methods of anti-mosquito prophylaxis, we are still in ignorance of the true origin of the yellow fever germ. A careful study of some epidemic revivals would tend to indicate that investigation should be directed to the soil; and several instances are now quoted in which, after some years of immunity, large public works have caused an outbreak of this disease.

T. P. B.

"Le Caducée," February 4, 1905.

Hygiéne Coloniale; De la prophylaxie du paludisme (Colonial Hygiene; Malaria prophylaxis). By Dr. Granjux.

In the Colonies all measures hitherto adopted come under the following general headings:—

(*a*) Destruction of mosquitoes and their habitats.

(*b*) Protection of the inhabitants from mosquito bites.

(*c*) The use of quinine as a cure and as a preventive.

The destruction of adult mosquitoes is not to be hoped for, and none extols this struggle; what is essential is that their larvæ should be attacked by suppressing all stagnant waters, or, in default, by pouring petroleum on the surface of these waters.

The protection of the inhabitants against mosquito bites has been attempted by means of fine gratings placed in the doors and windows of the houses, with a view to the exclusion of these insects. Those who have had recourse to this practice in Italy and in Corsica speak highly of the results. But the conclusion to be drawn from certain authoritative opinions are that these gratings and gauze-fittings, whilst excellent for the isolation of contagious cases, will only be an exceptional means in the prophylaxis of malaria, because it requires on the one hand constant supervision on the part of the authorities; and on the other hand, from those protected an obedience and a respect for orders which are only to be exceptionally found amongst Colonials, and never amongst natives.

As for the medical prophylaxis of malaria, this must be in accordance with the malarial history of the place; for instance, in Algeria for six months in the year all quinine prophylaxis is superfluous, but Koch's method must be resorted to in the event of the year threatening to be marked by a severe malarial epidemic.

As the action of quinine on the stomach is often to be deplored, the ideal method of administration of this drug—especially when its prolonged use is in question as in prophylactic medication—is to convey a soluble salt of quinine, such as the hydrochlorate, directly into the intestine. This can be done by encasing this salt with gluten which is not attacked by the acid gastric juice, but is dissolved in the alkaline intestinal secretions; moreover, these glutenised globules of hydrochlorate of quinine not being influenced by heat or by damp, are the best medicinal form for malaria prophylaxis.

In conclusion, Dr. Granjux states:—

(1) The disappearance—or, as an alternative, the petrolage—of stagnant waters from the vicinity of any habited centre, is imperative. These measures must be insisted on with energy and without exception.

(2) The mechanical protection of habitations is only applicable under exceptional conditions which are rarely to be found.

(3) Medicinal prophylaxis is worthy of retention. If this be judiciously regulated by a physician, it means the protection of explorers, of workmen who have to break the soil, and of expeditionary forces.

(4) In malarial districts, whatever be the method of prophylaxis employed, general and individual hygiene is required more rigorously than anywhere else.

T. P. B.

"Presse Medicale," November 5, 1904.

Contagiousness in France of Amboeic Dysentery. By M. Dopter.

Dopter contends that amœbic dysentery is not confined to the Tropics nor to persons who have returned to Europe from the Tropics. In France cases of amœbic dysentery occur, and Dopter is of the opinion that the disease is contagious.

"Arch. für Schiffs und Trop.-Hyg.," November, 1904.

Sleeping Sickness and Trypanosoma.

Krüeger gives details of five cases of sleeping sickness observed in Togo. The youngest patient was 9, and the oldest 35 years of age. The disease was attended by increase of temperature in the early stages, but fell to normal later, and in the latest stages was considerably below normal. Examination of the blood showed red corpuscles decreased, white corpuscles increased, and lymphocytes twice the normal number. In each case Castellani's trypanosome was found in the cerebro-spinal fluid, but in the peripheral blood in only one patient. Krüeger concludes that: (1) Sleeping sickness is a chronic disease of an infectious nature; (2) it is due to a trypanosoma to be found in the cerebro-spinal fluid; (3) the trypanosoma cannot be demonstrated in the cerebro-spinal fluid after death, even when looked for twelve hours after death; (4) nineteen animals injected with cerebro-spinal fluid from patients suffering with the disease died, three of them with symptoms of sleeping sickness; (5) sleeping sickness does not seem to be an intoxication due to food; (6) monkeys infected with tsetse trypanosoma died in the third week, and in their blood the trypansomes prevailed in greater numbers than in monkeys injected with the trypanosomes of sleeping sickness of human beings.

P. F.

"Archivio di Biologia normale e patologica," Firenze, 1903.

Ricerche e osservazioni sulpiede di Madura (Researches and Observations on Madura Foot). By Dr. G. Polverini, of the Pathological Institute of Florence.

Polverini states that as madura foot or mycetoma had been only sparingly mentioned in Italian literature, he availed himself whilst in India of the opportunity of studying some cases both clinically and bacteriologically, and afterwards followed up his studies by histological research in the laboratory at Florence. After giving a full description of this disease and of the experiments carried out by himself, he raises the ques-

tion as to whether actinomycosis and mycetoma are two identical forms of disease caused by the same micro-organism, or whether they are separate entities.

He states that it is at once seen that the two diseases differ from each other, whether as regards their seat, their course, or the changes produced in the tissues; that actinomycosis is more frequently found in animals than in man, whilst up to now no case of mycetoma had been described as having occurred in animals; that the histological lesions produced by the two micro-organisms are different; that the club-shaped terminations which are found in actinomyces do not exist, or at all events cannot be demonstrated by the same methods, in mycetoma. He also lays stress on the great difference which exists between the two micro-organisms when artificially cultivated, for whilst the *Streptothrix maduræ* grows readily on nutritive media made with hay-infusion, *actinomyces* grows badly on such media. Streptothrix does not liquefy gelatine, whilst actinomyces does; streptothrix does not grow in blood serum or on egg, whilst actinomyces will do so; actinomyces can be inoculated experimentally in animals, whilst streptothrix is not at all pathogenic for animals; the filaments of streptothrix are finer and more delicate than those of actinomyces.

As the result of his studies the author is convinced that actinomycosis and mycetoma, although they have some points of resemblance, are two distinct diseases, and that their identity cannot be reasonably admitted.

J. E. N.

"Rivista Critica di Clinica Medica." Anno y., Firenze, 1905.

Note sul Tifo Ricorrente, &c. (Notes on Recurring Typhus (? Relapsing Fever), with Special Reference to the Differential Diagnosis between this Disease and Bubonic Plague). By Dr. G. Polverini.

Polverini quotes some observations derived from his personal experiences during his stay in Bombay from 1898 to 1902. He noticed that, as a rule, the two diseases, whilst often prevalent at the same time, appeared to alternate in epidemic severity, plague predominating during the cold, dry weather, and recurring typhus during the hot weather and the rains.

The more prominent symptoms of recurring typhus were marked enlargement of the spleen, nearly always accompanied by enlargement and tenderness of the liver; icteric staining of the conjunctivæ and a high bodily temperature, the latter generally lasting about seven days and then terminating by crisis, but apt to be followed by a relapse after an interval of about a week; but the symptom on which Dr. Polverini lays great stress was the occasional tumefaction and inflammation of the lymphatic glands, which he looks upon, however, only as a complication. In recurring typhus the condition of the lymphatic glands is one of enlargement only, and although they may be tender on pressure, they are not of a serious nature, nor do they tend to suppurate; they may also appear early in the disease. An examination of the blood only demonstrates the presence of the *Spirillum Obermeieri*.

The author now quotes at length a hypothetical but possible case, in which a ship's surgeon might be suddenly called upon to diagnose quickly between recurring typhus and plague. He recommends first an examination of the patient's blood by the wet film method, when, if present, the spirilla are often readily seen. If this method prove negative, he now tries the dry film process, fixing the blood film with absolute alcohol and then staining it with diluted Ziehl's fluid; by this means the spirilla, if present, are coloured, and the plague bacilli take on a bipolar staining; but it not infrequently happens that the blood does not reveal the presence of micro-organisms, in which case the supposed bubo must be punctured and the pulp microscopically examined. If, again, this method fails to show any bacillary forms, the surgeon must have recourse to the only means of diagnosis left for demonstrating the possible presence of Obermeier's spirillum, and that is splenic puncture under antiseptic precautions. To complete the diagnosis the red blood cells may be counted, as in recurring typhus they are markedly diminished in number, whilst the leucocytes are increased, and although in plague there may be a certain amount of leucocytosis, nevertheless there is no corresponding diminution of the red blood cells. It must, however, be borne in mind that cases are on record in which the two diseases have occurred together in the same patient.

J. E. N.

EXCHANGES.

Annali di Medicina Navale. Annali d' Igiene Sperimentale Archiv für Schiffs u. Tropen Hygiene. Archives de Medicine Navale. Archives Russes de Pathologie, de Médec. Clinique et de Bacteriologie. Australasian Medical Gazette. Boletin de Medicina Naval. Boston Medical and Surgical Journal. Bristol Medico-Chirurgical Journal. British and Colonial Druggist. British Journal of Dermatology. British Medical Journal. Brooklyn Medical Journal. Caducée. Climate. Clinical Journal. Clinical Review. Giornale Medico del R. Esercito. Hong Kong Telegraph. Il Policlinico. Indian Medical Gazette. Indian Medical Record. Indian Public Health. Interstate Medical Journal. Jahresbericht. Janus. Journal of the Royal Army Medical Corps. Journal of Balneology and Climatology. Journal of Laryngology and Otology. Journal of the American Medical Association. La Grèce Médicale. Lancet. Liverpool Medico-Chirurgical Journal. Medical Brief. Medical Missionary Journal. Medical Record. Medical Review. Merck's Archives. New York Medical Journal. New York Post-Graduate. Pacific Medical Journal. Polyclinic. Public Health. Revista de Medicina Tropical. Revista Medica de S. Paulo. Sei-i-Kwai Medical Journal. The Hospital. The Northumberland and Durham Medical Journal. Transactions of the American Microscopical Society. Treatment. West India Committee Circular.

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Original Communications.

THE USE OF CYLLIN IN SPRUE.

By William Hartigan, M.D., D.P.H.

Sprue, to give its common though not very appropriate name (for the sprue described by Dutch writers is, both in its course and lesions, totally distinct from the disease known under that name in China), is a complaint so baffling, so difficult to cure, recurring so frequently after apparent recovery, that any hint as to its treatment is worth recording.

Sprue shows itself in various forms, not merely as mild and severe, but with actual differences in inception, onset and progress. Many seemingly favourable cases prove most intractable, whilst others, veritable skeletons, unable to digest the simplest food, make rapid and complete recoveries.

In the majority of cases which quickly respond to treatment the mischief is, I believe, confined to about the lower eighteen inches of the bowel, whilst in the intractable cases the upper portion of the colon and probably lower part of ileum (*pace* the ileo-cæcal valve) are involved. Hence, in the former, the almost certain efficacy of *copious* antiseptic lavage, when *properly* carried out with the soft rubber tube inserted at least twenty-four inches into the bowel; whilst in the latter, although such "washings" may lessen the odour and frequency of the stools, they have little or no effect on the actual course of the disease.

Somewhat similarly if a liver abscess is subcapsular, situated near the surface, operation almost assures a cure; if, on the contrary, the abscess is "deep," the result is at least doubtful. In the one case we have got at the root of the evil, in the other only lessened it, the bacteria flourishing vigorously, owing to difficulties of drainage and asepticism, a fact pointed out by Mr. Cantlie.

It is possible that the original site of disease is the rectum and that it gradually creeps up the bowel; but if so, its progress must be very slow, for I have known cases where the disease lasted from two to four years with all the usual symptoms—wasting, sore tongue, frequent and abundant frothy stools—which were quite cured by "lavage" in two months. Others, who perhaps had at first less discomfort, two morning stools, a large and only slightly sore tongue, fairly well-nourished bodies, have steadily resisted all treatment, gradually lost weight, the stools have become enormous, consisting of frothy liquid, like that in a brewing vat, without bile and usually without mucus. The patients are unable to take the mildest or simplest nourishment on account of the pain caused to the mouth and tongue, and the almost immediate evacuation thereby brought on. In these apparent improvements may occur, followed by invariable relapse and eventuating in death.

In such cases "lavage" was useless, never reaching the site of disease. Could we have attacked it locally with antiseptics we should probably be equally successful in both class of cases.

We know little of the etiology of sprue, but we do know that its fatality is due to inability to assimilate food, the idea being that "the intestinal juices" are at fault, the wasted tubules producing a secretion deficient in quantity and poor in quality.

The liver also wastes *pari passu* with the disease; hence its general functions are impaired and the diminution or absence of bile contributes largely to the fermentation in the intestines, the distended abdomen and frothy stools. This explanation has for a long time seemed to me unsatisfactory. If the malassimilation were due to disease of the tubules, how account for the rapid recovery which, as I have said, frequently occurs after a few antiseptic injections; and if by similar means we are able to insure a like recovery in the second class of cases, this question becomes still more pertinent.

Dr. Begg, of Bath, informs me that slides taken from a case of sprue showed portions of the lower bowel to be covered by a gelatinous-like substance, shown by recent staining to be organised, in which were millions of rod-shaped bacteria. Underneath this layer the mucous membrane was breaking up as a natural consequence of pressure, and in course of time may be destroyed.

Supposing bacteria to be the cause of this disease, the efficacy of germicides would be explained and their presence would likewise account for the injury to the mucous membrane, owing to pressure by a semi-organised layer on the tubules and their consequent inability to perform their functions. Being convinced of the value of antiseptics applied locally, I have sought for a germicide which could be given internally with equally good results.

I tried boracic acid, so efficient locally, but it soon produced headache and increased digestive troubles; carbolic acid was likewise ill borne, salol made the stools more healthy, but did not cure; perchloride of mercury, so useful in the diarrhœa of children, was useless; naphthol also proved inefficient. Ordinary astringents, except for very occasional use, are harmful.

Dr. Bousfield's experiments with cyllin, a new disinfectant of the cresol series, showed that the *B. coli* in a normal intestine were practically destroyed *without constitutional disturbance*, being reduced 97 per cent. This furnished the clue I sought, and I soon was able to try the drug in sprue. Given in the form of intestinal palatinoids, 3 m. cyllin in each, which pass undigested through the stomach, but dissolve in the intestinal canal, I found them invariably well borne, the only complaint being of slight eructation, which soon passed off, and now with a purer product does not occur at all; the number of stools rapidly diminished, but constipation was not produced; in fact, the palatinoids seemed to regulate the bowels, as in two cases, practically cured, where there had been one motion per day, on stopping the palatinoids the bowels became irregular, one and even two days being missed, which in sprue is almost certain to cause a return of diarrhœa, but one palatinoid given at night produced a healthy morning stool.

The motions first lost their frothy character, then became gradually bile-stained and more consistent; the offensive odour slowly passed off, till finally the motions became formed or semi-formed, and, it is to be noted, never assumed the form of huge putty-like

masses seen in those cases where milk alone is given, in which so often constipation alternates with diarrhœa.

The palatinoids may be given every second hour, if necessary, but rarely more than eight a day are required, and very soon two or three suffice, the physician being guided by the nature and number of the stools. They are best given an hour after food.

The soreness of the tongue—psilosis, from which Thin named the disease—though it may not entirely disappear for months after the patient is really well, gradually lessens; but here local medication, cocaine, boric acid, &c., is undoubtedly useful, making the taking of nourishment easier and frequently postponing an evacuation, the orders for which an inflamed tongue convey to an irritable though convalescent intestine.

The tenderness so frequently noted over the lower part of the abdomen, not merely over the large intestine, as one might suppose, though there are often two or more particularly tender spots over the rectum, disappears, likewise distension, though flatulence, that curse of recovering sprue cases, may cause actual suffering for a year or more. Above all, there is a steady increase in weight, with ability to endure cold and take exercise without fatigue.

The great advantage of giving cyllin is that it enables the patient to resume an ordinary though restricted diet much sooner than when treated by dieting alone.

In a severe case of what I may term the intestinal form of sprue I should allow only milk, Benger's Food, and a good meat juice, for choice "Ramornie" brand, Australian, or Valentine's; then gradually give fish; underdone steak and mutton, eggs, fresh meat juice and scraped beef are often well borne from the first; bread and butter or boiled bread and milk frequently disagree.

I have rarely been obliged to have recourse to milk alone, and my experience of cases treated solely by rest and milk diet is that they take a much longer time to "get well," that their recovery is often not complete, relapses, particularly on returning to a hot climate, are frequent, showing, in my opinion, that whilst rest enables milk to be digested and thereby immensely improves the patient's condition, enabling him to recruit his army of phagocytes and bring them to do battle with the bacteria which are killing him, it only scotches, but does not kill the germs. Consequently, whilst he remains in a temperate, bracing climate, under conditions which do not lend themselves to bacterial propagation, he keeps fairly if not quite well, but on return to those conditions under which the bacteria originally bred and flourished, their merely dormant energies are again aroused, they breed actively, increase enormously, and are only checked in doing irreparable damage by the patient's caution, whose experience teaches him to be warned by the least symptom of recurrence and promptly go to bed and take milk.

Three patients who have returned to the East, having suffered severely from sprue and been cured by cyllin, have had no relapses or necessity for restricted diet.

Dr. Begg speaks highly of crude santonin given for the same object. One case came under my notice which, whilst under treatment by milk alone, had frequent relapses, but recovered completely after the exhibition of santonin. This drug frequently gives rise to general though temporary disturbance, a disadvantage which does not apply to cyllin. Other drugs will probably be found with similar favourable germicidal action.

To the principle underlying the treatment of this disease, not so much as to the drug used, I wish to call attention.

I had intended to illustrate this paper by cases, but its length precludes this.

I have made no statement which is unsupported by facts and incidences occurring in my own practice.

THE BREEDING AND REARING OF FOREIGN CATTLE IN THE TROPICS.

By Percy N. Gerrard, M.D.
Kaiping, Perak, Federated Malay States.

The following communication was addressed in the form of a letter to the Editors:—

May I be permitted a few lines in answer to your excellent leader for the week ending November 1, 1904, which has only just reached me. The questions involved in the heading, namely, the feeding of the Eastern communities, is surely one of the most vital; the effects of which the medical officer is called upon to face in warm countries, not, however, from the veterinary surgeon's standpoint, nor yet from the standpoint of the stock raiser, but from the infinitely more important one of the health and even the existence of Europeans and natives congregated in tropical towns; but the lamentable fact, however, remains, without a doubt, that generally speaking, in colonies and protectorates, unfortunately, the recommendations of medical men on such matters as food supply are frequently treated cavalierly or completely ignored.

As a means of dealing with a most essential part of the question introduced, I would suggest that, before relegating the matter to a Commission, a small business-like committee should be formed at home to collect short reports and suggestions which have been made already on the local foodstuffs and supplies by medical officers in the various colonies, and who shall eventually recommend—as I have not the slightest doubt they will do—*that British Colonial Governments shall establish, at as early a time as is consistent with the local wants, Government commissariat departments.* Stations as they open out, that is after, say, fifteen to twenty years from their establishment, occasionally have some one amongst them who takes his chance of regaining his own on imported sheep, goats, or cows, but I well remember a time when my dinner *menu* was for many days in the month somewhat as follows: *Hors d'œuvres*, chicken; *paté-soup*, hen; *entrée*, fowl, stewed! *joint*, roast *volaille*, in other words, chicken; *savoury*, liver on toast; and my regret has always been that my cook never could or would make a poultry pudding! There was practically no game in the district. This state of affairs is unnecessary, destructive of constitutions and of good work in out-stations.

Proper travelling refrigerators, with a central cold store, would prevent countless cases of intestinal trouble, and obviate the atrocious depression which monotony of diet induces even perhaps more quickly than tropical stress.

Although I am not in a position to quote "chapter and verse" in the matter of suggestions which have already been made by medical officers of methods to improve the beef and mutton of communities, yet many recommendations have been made by individuals, and also by groups of medical officers, on the question of the milk supply of certain towns, where there were sufficient cows, but where the milking arrangements were, and still are, revolting in their dirty simplicity.

Only a few days ago I learnt from an official that he had observed the "amusing" sight of a Bengalee washing his back hair in his beautifully polished (outside), copper-fastened, extra special, sanitary board, milk tin!

I have, in common with many other Anglo-Easterns, partaken of milk which has been preserved by freezing, and which is stocked in the refrigerators of the Canadian Pacific boats, and I can see no reason why milk in this condition (if proper arrangement were made) could not be carried to any out-station within 100 miles of any coast, from whence there exist roads or bridle-paths into the interior, or even 300 to 500 miles in places where railways exist,

I would therefore beg to suggest that, before any expensive scientific commission of trained experts be appointed, as suggested in your leader, a cheap, *i.e.*, non-travelling central committee be selected to enquire into the relative economical values of (*a*) stocking countries, which must remain destructive of domestic animal life for an indefinite time to come; (*b*) the value of central cold stores with travelling refrigerators under the control of a Govertment commissariat officer. An army must be fed, and is fed; why neglect our civil servants and other exiles who, after all, are making our Empire more than our army, because as they march they solidify their conquests by leaving in their wake towns, courts of justice, hospitals, and all the paraphernalia of civilisation.

I do not, however, propose to neglect local tropical cattle by my establishment of commissariat departments; but, as I do not know of any colony which has not now got its own veterinary surgeon to look after the local cattle, who imposes quarantine and limits disease, I submit that sufficient is being done from a political and economical standpoint in the matter of cattle, but that nothing is being done from either a political or economical point of view to feed our civil servants and others in the Tropics; and I am convinced that this is the direction in which we should proceed, and upon which money should be expended at the present time.

If, as you state, the rearing of cattle "will necessitate a radical change in the agriculture of the Far East," and again, if the quality of the meat available at present is poor, which it certainly is, then but one path remains to us, and that is to kill and freeze the cattle where they are healthy, and arrange for their cold transport.

THE RELATIVE POSITION OF SCHISTOSOMA CATTOI AND "BILHARZIA" AS REGARDS PATHOGENY.

By G. Lydston Crimp, B.A., B.C.(Cantab).

Late Deputy for Professor of Pathology, Government Medical School, Cairo.

Having just had an opportunity while up country in Egypt of seeing a copy of the *British Medical Journal* of January 7th, which contains the very interesting and exceedingly careful contribution of Dr. Catto on a new schistosoma found by him, I feel that I must make a communication pointing out several places wherein he has, doubtless from lack of opportunity for personal observation, made a few errors.

I am sure, from the general care evinced in the examination of the case in question, that he will realise that it is in no captious spirit that I write, but a year spent in the middle of bilharzia material has given me certain opportunities for observation which he has lacked.

Of the facts which he describes I have nothing to criticise, for although in the case of dissection of formaline specimens I know it to be exceedingly difficult to obtain anything approaching a respectable specimen of the worm itself, yet his plates speak for themselves. The special paragraph which contains the points at issue reads as follows:—

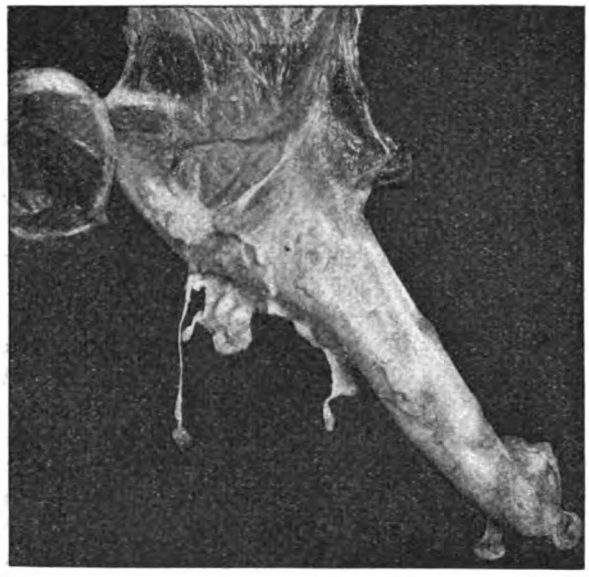
> The ulcerative lesions of the bowel produced by the new species differ from the corresponding lesions of the bladder produced by *S. hæmatobium* in the entire absence from the former of the fungating masses so characteristic of the latter. Further, the new species does not give rise to the perihepatic nodules as described by Sandwith in bilharziosis.
>
> In addition to the character of the ova and to the anatomical differences already noticed, there are certain other points which serve to differentiate the species.
>
> (1) The habitat of the *S. hæmatobium* is reputed to be venous only, whereas the habitat of the new schistosome is mainly arterial. Too much stress must not be laid on this point, seeing that it has not been proved that the former cannot affect the arteries or the latter veins.
>
> (2) The ova of *S. hæmatobium* affect mainly the urinary system, and escape from their human hosts by this channel. In the new species the ova apparently exclusively affect the alimentary system, escaping by this route from their human host.
>
> (3) In this case there is a much more general infection of abdominal viscera, for ova of *S. hæmatobium* have not been found in the pancreas and appendix.

It is impossible to compare the ulcerative lesions of the bowel caused by the new species with those of the bladder in "bilharziosis," because, in the latter, *both* organs are on one occasion or another affected, singly or conjointly, and the lesions in both organs are polymorphic. The "so characteristic fungating masses" do undoubtedly occur in vesical bilharziosis, but are not by any means the most frequent manifestation of this disease; while in the colon and rectum the type of ulceration observed is so varying as to have left me unable definitely to connote any one type with undoubted bilharziosis.

In this place it is but due to other workers to express, in very definite terms, the fact that the perihepatic nodules "described by Sandwith" owe their definite demonstration to Symmers (*Journal Path. and Bact.*, 1903), while Kartulis ("Weitere

Beiträge zur Path. Anat. der Bilharz," *Virch. Arch.*, 1898) had surmised the probable relation between the eggs and certain proliferations of the periportal connective tissue.

The second specific difference quoted above cannot hold water, in that, although in bilharziosis vesical lesions do perhaps predominate over intestinal, yet the latter are very frequent; while one case of infection by *Schistosoma Cattoi* is not enough to demonstrate the exclusive use of the rectum as a channel for evacuation of the latter.



Bilharziosis of Appendix.

Less still must we accept the third specific pathogenetic difference, that of the more or less diffusion of its influence. I have cases (as yet unpublished) where practically the whole intestinal and vesical tracts have been affected, besides the peritoneum, liver, and lung, and in some of which the most noticeable feature has been the *gross infection of the appendix*. I had intended publishing a note of these appendix cases earlier, but have been prevented by circumstances of time and place. However, as I happen to have with me a photograph of an affected appendix, I am now forwarding it to Sir Patrick Manson. It demonstrates an incrustation of the organ with a number of subserous nodules (some pedunculated), which microscopically are found to consist of whorls of fine connective tissue enclosing a number of bilharzia eggs, mostly possessing lateral spines.

Thus, although there seems very good reason to accept the morphological specificity of *S. Cattoi*, I consider that there is the slenderest possible evidence as to the difference in its pathogenetic possibilities.

To conclude, my experience as regards the liver in all cases of bilharziosis is in the same line with Kartulis, whose paper demonstrated the total impossibility of connoting any one *clinical* state of that organ with bilharzial infection.

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THE

Journal of Tropical Medicine

March 1, 1905.

CANCER IN BRITISH COLONIES.

In May, 1903, Mr. Chamberlain, when Secretary of State for the Colonies, issued a circular addressed to Governors and High Commissioners of the Crown Colonies and Protectorates inviting the co-operation of Government medical officers and private practitioners in the Colonies in the work being carried out under the auspices of the Cancer Research Fund. In the Blue-book just published a great deal of information on the subject of the prevalence of cancer amongst populations indigenous to the Tropics is collated. It is perhaps misleading to style the disease concerning which information is being sought "Cancer"; it would have been in all probability more accurate to have asked information in regard to Malignant Disease, including under that heading sarcomatous and carcinomatous affections. The diagnosis between sarcoma and carcinoma is not always determinable by clinical methods, and microscopic examinations are but occasionally possible in districts remote from medical centres. It is probable that sarcoma, although rare in the Tropics, is yet more commonly met with than is carcinoma, but neither the one nor the other occurs except very occasionally. It would seem as though malignant diseases, like some other ailments, diminish in frequency of occurrence as the Equator is approached from the north. In the African continent cancer has not been seen amongst natives of the

Gambia, Ashanti, and Natal. It is said to be rare in British Central Africa, the Eastern African Protectorate, Southern Nigeria, and on the Gold Coast. In the latter group, although the disease is reported to occur rarely, the returns seem rather to point to its possible absence in several of them. Thus in British Central Africa, although the Commissioner reports that cancer exists, Dr. Scott, of the Zomba Mission, during a fifteen years' residence there, had never seen a case; and Dr. Morris, of the Blantyre Mission, saw only one "supposed" case of cancer in four years. Dr. Old, during several years spent in British Central Africa, saw two cases of sarcoma but no case of cancer. In the Gold Coast Colony and Protectorates, Dr. W. R. Henderson, Principal Medical Officer, states that during ten years' observation he had never seen a case of cancer, so that we have no distinct medical testimony that carcinoma exists at all in the group in which cancer is described as rare. In St. Helena and Mauritius cases of carcinoma are reported; in the former, some three or four cases yearly in a population of 3,000 to 4,000. It must be remembered, however, that both in St. Helena and Mauritius the populations are of a heterogeneous or mixed character.

The reports from Asia are meagre; no cancer in Wei-hai-wei; but in Ceylon the number of cases occurring yearly is about 220. Sarcoma is said to be more uncommon in Ceylon than is carcinoma. Australasian reports state that malignant diseases have not been seen amongst aborigines in Queensland nor amongst the Pacific islanders, and Sir William MacGregor mentions having seen only one case of cancer during ten years in British New Guinea.

In the West India Islands reported upon, Grenada, the Leeward Islands and British Honduras, cancer is said not to be so common as in England. There are several interesting points that require to be cleared up. Do British emigrants resident in Crown colonies suffer more or less from malignant diseases than do people resident in Britain? Does the half-caste population suffer from the disease more than do either their white or coloured co-residents, and have mixed populations, whatever the parentage, a tendency to the disease? There is some evidence that Eurasians suffer from malignant diseases to a greater extent than do pure-bred natives, and that white people in the Tropics are less likely to be attacked than are their relatives at home. Seeing that microscopic investigation of the nature of malignant diseases generally is faulty, the age limit would seem to be the only practical basis on which to found an enquiry. It should be distinctly stated whether the sufferer is over or under thirty-five; and were a few clinical details given with each case, the assumption that the disease is sarcoma when under that age and carcinoma when over that age might be a justifiable basis on which to found a conclusion.

SEAMEN'S HOSPITAL SOCIETY.

At the Branch Hospital of the Seamen's Hospital Society at the Royal Albert Docks, London, Sir George R. Vyvyan, K.C.M.G., on February 9th, unveiled a new tablet over the Trinity House Bed. Sir George is the Deputy-Master of Trinity House; and the Chairman of the Seamen's Hospital Society, Mr. Perceval A. Nairne, referred in his address of welcome to the consistent support the Society had received for some eighty years from the Trinity House Corporation, the premier marine corporation of the world. Sir Patrick Manson, K.C.M.G., F.R.S., stated that the Seamen's Hospital Society and the School of Tropical Medicine in London, which was associated with it, had done good and useful work in behalf of the seafaring population of the country by providing a training in tropical medicine to surgeons in the Navy and Mercantile Marine. Sir George Vyvyan unveiled the tablet and said he was glad to think that the Corporation he represented had contributed so largely and for so many years to the funds of so deserving an institution as the Seamen's Hospital Society, and that Trinity House thereby helped to maintain not only the Hospital, under the direction of the Society, but also the Tropical School attached to the Branch Hospital. The School, although it had been in existence a few years only, had done excellent service to the Empire, and he hoped that the appeal for money which the Society was about to make in May, when Mr. Chamberlain was to preside over a banquet to enable the Society to clear off the debt they had incurred in behalf of the School, would be as eminently successful as it deserved to be. A permanent endowment was required for the School, and amongst the many persons interested in mercantile and colonial enterprises in this country there should surely be no difficulty in obtaining a substantial sum towards that end.

RAINFALL AND THE PREVALENCE OF DISEASE IN INDIA.

During the recent years of drought and famine in India owing to deficient rainfall, the normal increase of population was markedly checked. In Gujerat the population decreased by 19·1 per cent., whilst the rainfall was 20 per cent. below the normal; in Western Rajputana the figures were 18·9 and 22; in Central India, 14·8 and 22; in Bombay district, 8·1 and 11; in the Central Provinces, 8 and 5.

During the decennium 1891 to 1901, which included the years of drought and famine, disease claimed many victims, and there can be no doubt that the feeble condition of the people owing to famine was responsible for the inroads of several diseases. Cholera during the period caused 4½ million deaths; plague, 321,000; and malaria fever incapacitated a multitude of the inhabi-

tants. The decrease of population occurred during the six years of diminished rainfall, 1895 to 1900.

Taking, however, the ten years from 1891 to 1901, the total shortage of population is practically *nil*, or only $\frac{1}{186}$ of the normal total.

Extended irrigation is the only means of averting famine in India, and thereby lessening the mortality from several epidemic diseases that invariably accompany starvation.

"Annal d'Hygiène et de Médecine Coloniales," No. 1, 1905.

1. Le Pian au Camboge (Yaws in Cambodge). By Dr. Montel.

2. *Apropos* d'Ainhum (a Case of Ainhum). By M. Vivie.

(1) Six per cent. of infants vaccinated have yaws. The natives describe three varieties:—

(*a*) Framboesia, raspberry form.

(*b*) Crab-yaws.

(*c*) Plantar yaws is so common that twenty-two cases were found in one hundred and twenty native soldiers. Long fissures are seen in the thickened epidermis; on shaving this off a papilla is seen swollen like a raspberry. On removing the whole epidermis alveoli are seen filled with a cheesy-white material. In all forms the crusts and scrapings show vegetable parasites, mycelium, spores, and aspergilli, which are connected with the pathology of the disease.

The syphilitic origin of yaws is disproved by syphilitic patients contracting yaws, and cases of yaws contract syphilis.

Treatment by mercury is useless. Iodide of potash in progressive doses, beginning with 15 grains, and local application of tincture of iodine, are rapidly beneficial. A picture is given of a child who had sixty-six pustules distributed in various parts.

(2) On the Ivory Coast ainhum is very common, but its progress very slow. It begins as a ring of cutaneous induration, which constricts the base of the toe so that the end of the toe falls off. It begins on the little toe, but may invade the next or even the middle toe.

A picture is given of two feet: the left little toe had been almost loose, and had been snipped off; the right little toe is markedly constricted. The other toes show constrictions at an early stage. There was no trace of leprosy.

T. P. B.

"Medicinskoe Obozregenie," Moscow, vol. lx., No. 21, 1904.

Malarial Affections of Nervous System. By V. P. Dobrokhotoff.

Dobrokhotoff mentions mental depression, neuralgia and neuritis as common sequelæ of malarial infection. A case of multiple sclerosis he describes is attributed to malaria. His opinion is that the parasites injure the endothelium of the blood-vessels, directly or by their toxins or their products, leading to thrombosis in the capillaries. The cerebral capillaries are, according to Dobrokhotoff, particularly liable to become thus affected with consecutive hæmorrhages. He attributes the parenchymatous changes in the liver, spleen, kidneys, and ganglion cells to malaria. Quinine is a potent remedy in affections of the kind.

Reprint.

SCHISTOSOMA CATTOI: A NEW BLOOD FLUKE OF MAN.

By John Catto, M.B., D.P.H.

Craggs Prizeman, 1904, *London School of Tropical Medicine.*

(From the *British Medical Journal* of January 7, 1905.)

While I was Resident Medical Officer at St. John's Island Quarantine Station, Singapore, cholera broke out on a passenger ship from China. Some four hundred coolies were quarantined. Amongst them was a Chinaman from the Province of Fukien, who presumably had never been away from China before.

He died of cholera after three days' illness. He was plump for a coolie. During life it was found that the right lobe of his liver extended two fingerbreadths below the costal margin. The left lobe was a handbreadth below the sternum, and its percussion dulness merged into the splenic. The spleen was palpable one inch from the iliac crest, and its notch was in line with the anterior axillary fold.

A necropsy was made an hour and a half after death. The adipose tissue throughout the body was a prominent feature. The appearance of the peritoneum suggested repeated attacks of peritonitis. The appendices epiploicæ were thickened, and in some places matted together. The recto-vesical pouch was almost obliterated. Encasing the large intestine was a coat of fat, most marked at the mesenteric attachment. The mesenteric tissues were all thickened and loaded with fat. The mesenteric and prevertebral glands varied in size from a bean to a golf ball, the largest forming a cluster near the duodenum. The liver was uniformly enlarged. Its surfaces were markedly nodular, its borders sharp and irregular, the whole presenting the appearance of a very coarse cirrhosis. Its consistence was greatly increased, but its colour was not appreciably altered. The coats of the gall-bladder were thickened, and a layer of fat almost completely encased this viscus, which was distended with clear mucoid, apple-jelly-like material containing several minute black gall-stones. The colon was much thickened throughout. The mucous membrane was swollen, hyperæmic, and friable, presenting numerous small circular, superficial erosions and patches of necrosis. The outer coats were very tough, almost cartilaginous, and showed no tendency to ulcerate. The rectum was three-quarters of an inch thick all round, and was adherent to the bladder. It nearly filled the true pelvis. Where adhesions had formed the bladder wall was thickened, but elsewhere it was healthy, and nowhere was the vesical mucosa diseased. The sigmoid was uniformly thickened; in tracing the bowel upwards the thickening became less marked and more patchy. The coats of the cæcum and appendix vermiformis were uniformly hypertrophied, the mucous membrane presenting small patches of ulceration and necrosis. The appendix was provided with a mesentery, and a distended lymphatic could be recognised running along its free surface. The liver and bowel cut gritty on section. The lower end of the ileum was thickened in patches, and the mucosa congested over corresponding areas. The enlarged spleen was pigmented. The stomach, pancreas, suprarenals, kidneys, heart, and lungs showed no signs of coarse disease.

As the lesions above mentioned were peculiar, some of the viscera were preserved. Sections of the liver, mesenteric lymphatic glands, and bowel (fig. 1) were made in Singapore by Dr. Finlayson, and at the Kuala Lumpor Research Institute by Dr. Daniels. Numerous small oval bodies having a smooth, stout capsule were found. Opinions differed as to whether these were coccidia or the ova of some unknown parasite, but the case was published in the Journal of the Malaya Branch of the British Medical Association as a case of coccidiosis in man. Subsequent examination in this country of sections of intestine showed ova and filaria-form embryos in bundles in the mucosa and villi of the small intestine. These, along with other specimens, were shown at the Medical Research Club, London, but no definite conclusion regarding the nature of the oval bodies was come to. An eminent German authority, to whom pieces of tissue were kindly sent by Dr. Bulloch, stated "that the oval bodies were neither coccidia nor the eggs of a trematode, but those of a nematode of unrecognisable species, &c." At Sir Patrick Manson's suggestion, to whom the specimens were shown, I devoted my whole time to working out the case at the London School of Tropical Medicine, where systematic examination and sections of all the preserved tissues were made. Soon after I commenced investigating, nematode embryos were found in smear preparations from the large intestine, and one was found in the vessel of a mesenteric lymphatic gland. These facts, coupled with the juxtaposition of ova—some empty—and embryos in the mucosa and villi of the small intestine, led to the suggestion of a nematode infection, but as no evidence of a differentiated embryo could be seen in any of the eggs, even in those lying in close proximity to the bundles of free embryos, one hesitated to adopt this conclusion. Subsequently, in sections of the mesocolon, I found adult trematodes, male and female, in the blood-vessels (fig 9), the ova (fig. 9, O) in the uterus of the female corresponding in every particular with the oval bodies found in the various viscera. It was now clear that I had to deal with concomitant trematode and nematode infections; that the oval bodies were the ova of the trematode; and that their close association with filarial embryos was merely accidental.

A preliminary paper was read and drawings with specimens exhibited at the meeting of the British Medical Association at Oxford. Later, on continuing my dissections, entire mature worms were found in the smaller mesenteric blood-vessels (figs. 4 and 5). It was difficult to determine the nature of the vessels in which the mature parasites lay. They were manifestly blood-vessels, but whether arteries or veins was not so evident. I submitted my preparations to several eminent physiologists and pathologists. Unfortunately, there was no unanimity among them as to the arterial or venous nature of the vessels. I am constrained, therefore, to admit that this important point is for the present unsettled. My own conviction, however, is that the parasites occur in both arteries and veins (see fig. 2).

Parental Forms.

The male (figs. 4 and 5) is 9 mm. long, less than half a millimetre broad, and, in my spirit preparations, of a light brown-yellow colour. The measurements are only relative as they are taken from spirit specimens. Three entire adult males, with fragments of others, were found. They closely resemble those of *Schistosoma hæmatobium*, having their lateral borders incurved ventrally, thereby forming a canal groove along the entire length—the gynæcophoric canal—in which the female lies. The anterior extremity is blunt, with a terminal sucker in which the mouth lies. The dorsal lip of the sucker is longer than the ventral. Behind the sucker the body is slightly constricted, forming a neck. The worm attains its maximum breadth at the posterior sucker, which lies ventrally in the gynæcophoric canal about half a millimetre behind the anterior sucker, whence the body tapers gradually to a truncated posterior extremity. The posterior sucker is oval and trumpet-shaped, its long diameter being transverse; it is larger and more muscular than the anterior. Both suckers are retractile.

The alimentary system consists of a mouth furnished with a sphincter, a strong muscular œsophagus, and two cæca joining posteriorly to form a terminal ampulla. The œsophagus, surrounded by small glands, is constricted at its middle, and divides, just anterior to the acetabulum on which rests the posterior sucker, into the two cæca which run along either side of the body. Three anastomoses of the cæca were made out.

The excretory system ends in an excretory pore which is subterminal and ventral. The nervous system has not been satisfactorily determined. The reproductive system consists of a lobular testicle or testicles, vesiculi seminales, vas deferens, and genital pore with its sphincter, opening centrally into the gynæcophoric canal behind the posterior sucker.

A distinctive feature of this schistosome is the absence of ciliated warts on the integument, the presence of which constitutes so marked a feature of the African worm. Minor anatomical differences are: (*a*) Smaller size of the worm; (*b*) its longer vas deferens; (*c*) the characters of the testes.

The female (fig. 4, B) is almost cylindrical (diameter 0·113 mm.), longer, more slender, and darker than the male. The cervical constriction is quite as marked as in the male. The suckers, alimentary and excretory systems, correspond with those of the male, except that the excretory pore is terminal. Owing to excessive fragility of the spirit specimen it was found impracticable to mount an entire specimen of the female worm.

The reproductive system consists of a muscular, central, elongated uterus occupying the anterior half of the body, and opening near the posterior sucker. The ova are arranged irregularly in single or in double rows. At the posterior extremity of the uterus are the shell glands and opening of the oviduct with the vitello duct. Behind this the body bulges slightly to taper subsequently to a sharply-pointed extremity. The bulging marks the position of the ovary; posteriorly are the vitellogene glands.

From the female *Schistosoma hæmatobium* the following differences have been made out:—

(*a*) The posterior sucker is larger than the anterior the converse holds good in the *Schistosoma hæmatobium*.

(*b*) The bulging-in region of ovary is more marked.

(*c*) The arrangement of the yolk glands is different.

In both sexes minute, highly refractile spines are seen in the suckers and at their anterior extremities.

The eggs (fig. 7) are yellow-brown in colour, oval, measuring on an average 70 μ long by 40 μ broad. They vary between 60 μ and 90 μ in length and 30 μ to 50 μ in breadth. They have a stout, smooth shell on section. There is no trace of a spine or operculum. In the sections some of the ova were empty; others contained a central, circular mass which stained deeply; some contained cells staining at their periphery, whilst others had cells staining in the centre. These may or may not completely fill the ovum. In some cases the cellular contents were seen escaping from a ruptured ovum. In no one of the ova could distinct embryos be detected, although appearances suggestive of a developing embryo could be observed. The ova differ from those of *Schistosoma hæmatobium* in their colour, shape, size, and in the absence of a spine. The bilharzia ovum is of a brown colour, contains a well-developed embryo, and is larger, 0·19 mm. (Looss.) Moreover, its ends are more pointed, and it is provided with a spine.

The ulcerative lesions of the bowel produced by the new species differ from the corresponding lesions of the bladder produced by *S. hæmatobium* in the entire absence from the former of the fungating masses so characteristic of the latter. Further, the new species does not give rise to the perihepatic nodules as described by Sandwith in bilharziosis.

In addition to the character of the ova and to the anatomical differences already noted, there are certain other points which serve to differentiate the species.

(1) The habitat of *S. hæmatobium* is reputed to be venous only, whereas the habitat of the new schistosome is mainly arterial; too much stress must not be laid on this point, seeing it has not been proved that the former cannot affect arteries or the latter veins.

(2) The ova of *S. hæmatobium* affect mainly the urinary system, and escape from their human host by this channel. In the new species the ova apparently exclusively affect the alimentary system, escaping by this route from their human host.

(3) In this case there is a much more general infection of abdominal viscera, for ova of *S. hæmatobium* have not been found in the pancreas and appendix.

(4) The geographical distribution differs, for no case of bilharziosis has yet been met with in China.

Histopathology.

The parent worms are found in small groups at the bifurcations of the smaller mesenteric vessels, and partially or completely plug the vessels. In one arteriole 0·621 mm. in diameter two complete sections of the male and female are seen *in copula* (fig. 9). Blood-cells are occasionally seen between the wall of the vessel and the parasites.

Where ova accumulate they provoke at certain places a small-celled infiltration, which gives place later to a great proliferation of fibrous tissue. Pigment is seen in the liver and bowel. In the intestine from cæcum to anus the ova occupy roughly two concentric layers —the one subperitoneal, where the ova are comparatively scarce; the other in the submucous coat, where they are innumerable, in some cases densely packed (fig. 6). Between these zones in the muscular layers ova with their long axes at right angles to the bowel lie in single or in double rows. Ova are plentiful in the mucosa, are more numerous in the necrotic areas, and are seen apparently in process of extrusion (fig. 8) at the margin of an ulcer.

Of the intestinal tract, the rectum and appendix are most affected; the distended lymphatic vessel in the appendix already referred to is choked with ova. Everywhere throughout the small intestine ova were found, but only in patches and in relatively small numbers.

The obliteration of the recto-vesical pouch was probably caused by the irritation produced by ova accumulating in vast numbers in the wall of the rectum. In the many sections examined no ova were found in the vesical mucosa, though they were present in small numbers in the outer coats of the bladder.

In the liver the ova are plentiful, lying singly or in larger or smaller clumps embedded in the markedly hypertrophied fibrous connective tissue.

In many of the enlarged mesenteric lymphatic glands ova were found in the thickened trabeculæ.

In addition to the localities already mentioned ova were found in the outer wall of the gall-bladder, in the pancreas, liver capsule, fibrous coat of the larger mesenteric vessels, mesentery, pylorus, duodenum, jejunum, and ileum. Several sections were made of the round ligament of the liver and of the diaphragm without any ova being found.

Doubtless the life-history of the new schistosome corresponds with that of other trematodes, the geographical range of the intermediary host being the principal determining factor in its distribution.

That this case is unique is extremely improbable. When proper search has been made doubtless many additional cases will be found in the natives of the endemic districts. As a ready means of ascertaining the degree of prevalence and geographical range of the infection I would suggest systematic examination at *post-mortem* examinations of scrapings from the mucous membrane of the bowel, preferably of erosions or ulcerated patches. With a low power of the microscope only a few minutes are required to determine the presence or absence of the ova in such preparations.

The ova have probably been found many times in the course of ordinary microscopical examinations of fæces, but have been mistaken for the ova of *Ankylostoma duodenale*, which they closely resemble.

It is interesting to note the accumulation of filariaform embryos in the villi, probably in the lacteals, of the intestinal tract, and their presence in fæces. I am not aware of any similar observation.

Diagnosis.

Sub-Kingdom		Vermes.
Class	... ...	Plathelminthes.
Order	... ...	Trematoda.
Family	...	Schistosomidæ.
Genus	...	Schistosoma.
Species	...	Schistosoma Cattoi (Blanchard) 1904.

Measurements given below are from specimens found in hardened tissues;—

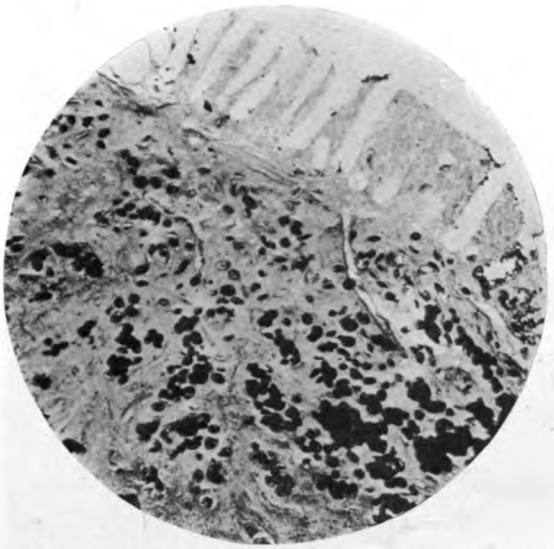

FIG. 1.—Ova in intestinal submucosa. At first taken to be coccidia.

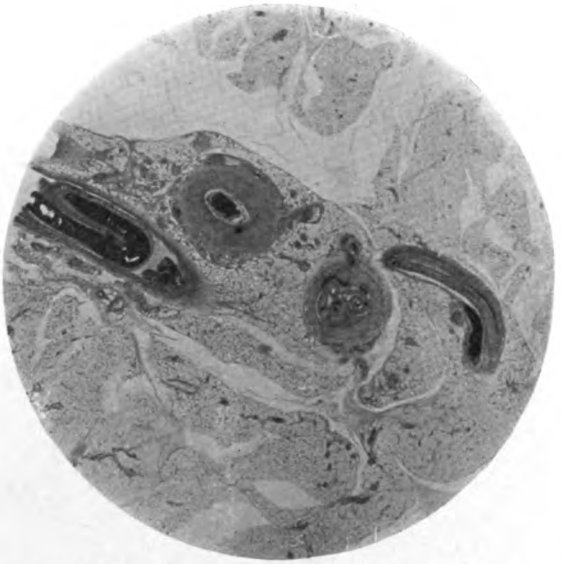

FIG. 2.—Section of mesentery. Worms seen lying in blood-vessels in transverse and longitudinal section. Note difference in thickness of vessel walls.

FIG. 3.—Magnified view of fig. 2, showing transverse section of blood-vessels with worms *in situ*. Note smooth cuticle.

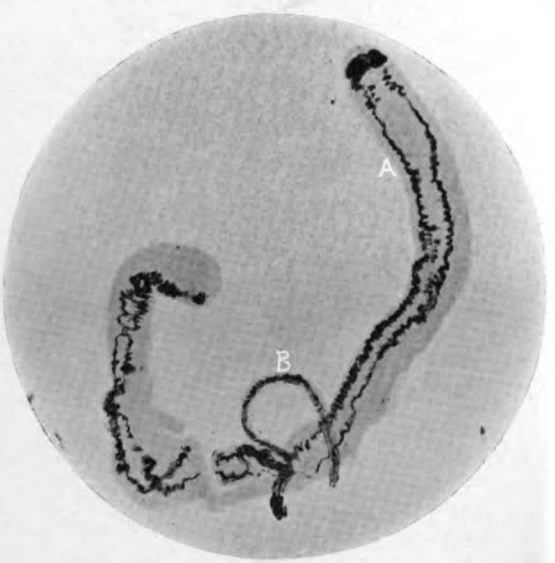

FIG. 4.—Male worm with a portion of female. A, Male worm showing cæca; B, female.

FIG. 5.—Male worm. Note smooth cuticle.

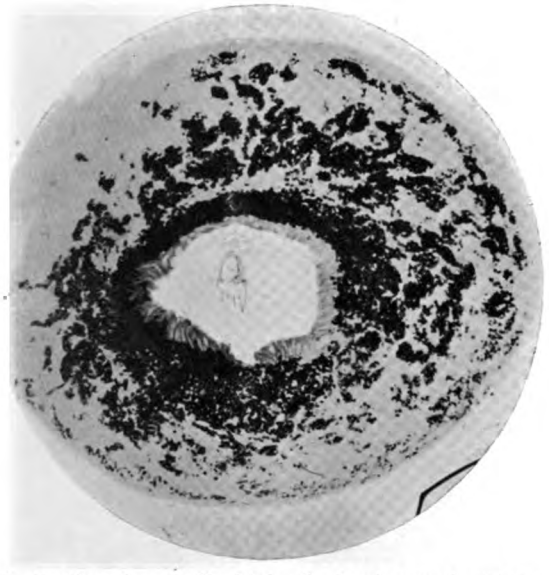

FIG. 6—Section of appendix (stained), showing ova in masses, a dense submucous layer, and a less marked subperitoneal layer.

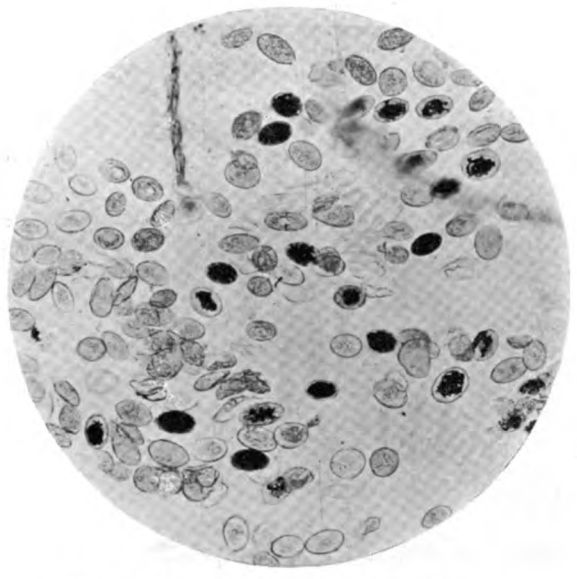

FIG. 7.—Magnified view of fig. 6, showing ova.

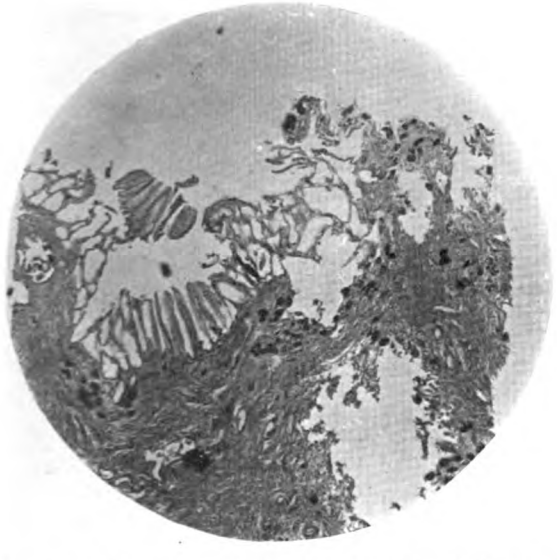

FIG. 8.—Ova in process of extrusion from intestinal mucosa.

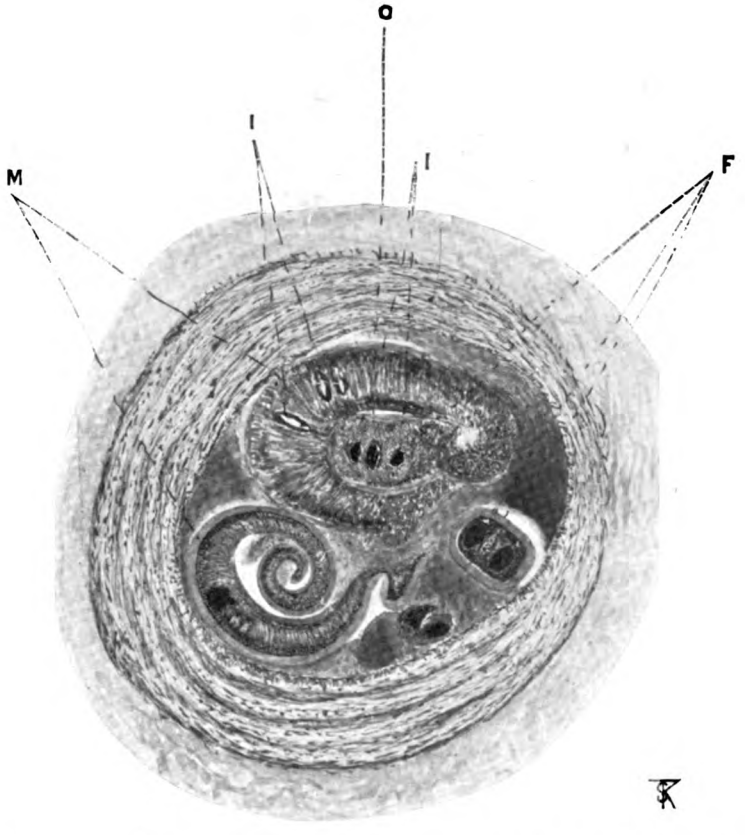

FIG. 9.—Transverse section of a mesenteric vessel showing: M, two male schistosomes; F, females; I, cæca in male; L, cæca in female; O, ovum. Magnification 56 ×.

SCHISTOSOMA CATTOI: A NEW BLOOD FLUKE IN MAN.

Bale & Danielsson, Ltd., London.

	Female.	Male.
Length	? mm.	... 9 mm.
Breadth	0·115 mm.	... 0·447 mm.
Breadth (near ovary)	0·134 mm.	—
Diameter at neck	0·041 mm.	... 0·180 mm.
Gynæcophoric canal	absent ...	entire length of body
Shape and size of posterior sucker	0·061 by 0·047 mm. (long. diam. longitudinal)	0·290 by 0.189 mm. (long. diam. transverse)
Shape and size of anterior sucker	0.05 mm. circular	0·124 mm. circular
Distance between centres of these	0·146 mm.	... 0·552 mm.
Genital pore...	behind posterior sucker	behind posterior sucker
Excretory pore	terminal	...subterminal
Tubercles and cilia	absent	... absent
Spines in suckers)	present, but scarce	present

Habitat of Adults: Mesenteric vessels.

Ova: Oval with rounded ends and smooth stout capsule, destitute of spine and operculum.

Size: 0·065 to 0·090 mm. by 0·030 to 0·050 mm.

Found in intestinal tract and its appendages.

Number of Cases: One.

Symptoms: Probably colic and dysentery.

Physical Signs: Enlarged liver and spleen.

Geographical Distribution: Province of Fukien, China.

Type Specimen: Museum of London Tropical School of Medicine. Mounted in xylol balsam unstained from preserved formalin tissue.

It is possible that the filariaform embryos above referred to also escaped into the lumen of the bowels from the ulcers, for on making smear preparations from various parts of the bowel these embryos were found. In one smear thirteen embryos were present, but in many others none were found. These embryos had the following measurements and characters; these, however, cannot be taken as accurate, as none were got in fresh state.

Average length	0·300 mm.
Greatest thickness	0·008 mm.
Sheath	present.
Shape of head	truncate conical.
,, tail	sharp pointed.

(The sheath in many cases could not be seen, but embryos may discard it when in unnatural surroundings.)

Ova of *Trichocephalus dispar*, *Ankylostoma duodenale*, *Ascaris lumbricoides*, in numbers, were found in the smears. Adult worms of all these were also found in the bowel.

I am deeply indebted to Sir Patrick Manson for much encouragement and criticism: and also for his sending specimens to the International Zoological Congress at Berne, where they were examined by Professor Blanchard, Dr. Loos, Ward, Stiles, Grassi, Monticelli, and other zoologists, who all agreed that the parasite was a schistosoma and new to science. Professor Blanchard has done me the honour of naming this new helminth *Schistosoma Cattoi*. To Drs. T. S. Kerr and E. E. Henderson the credit is due for the excellent drawings and photomicrographs.

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A NEW TREMATODE.

(Editorial comment issued with the reprint of Dr. Catto's article from the *British Medical Journal.*)

The activity in the study of tropical disease, so marked a feature in the medical history of the last few years, has given us many new facts—facts important in themselves but even more important on account of the light they throw on general pathology, and especially on the etiology of disease. Not the least interesting and curious of these discoveries is that of which the author, Dr. John Catto, gives a very complete account in our issue of to-day.

The profession has long been familiar with that curious trematode *Schistosoma hæmatobium* (*Bilharzia hæmatobia*) and the peculiar form of endemic hæmaturia for which it is responsible. The South African War has brought us many examples of this infection, and doubtless, as the extensive endemic areas infested by the parasite come to be settled up, the disease will become even more familiar to the profession in England. Although recently it has been shown that this or a similar parasite may be acquired in the West Indies, in the United States of America, in Mesopotamia, and in India, yet in these countries it is very uncommon. Bilharzia is essentially a parasite of Africa, where in not a few localities—Egypt, for example—it is present in a large proportion of the inhabitants.

It would appear, however, that Asia, though practically exempt from the endemic hæmaturia produced by *S. hæmatobium*, possesses a schistosome of its own, also a blood parasite, though not involving, like the familiar schistosome, the urinary tract and portal circulation, but affecting principally the intestinal tract and mesenteric arteries, and giving rise to inflammatory and ulcerative lesions in the intestinal mucous membrane.

As to the specific differences between the two parasites, Dr. Catto's observations leave us in no doubt. The ova alone are distinctive, the *S. hæmatobium* producing a spined ovum with a thick brown shell containing a ciliated embryo, the *S. Cattoi* producing a non-spined ovum with a thinner and more transparent shell enclosing an embryo which does not develop in the human body beyond the morula stage. Furthermore, the male *S. hæmatobium* is provided with a tuberculated integument, whereas the integument of the male *S. Cattoi* is smooth, without irregularities of any sort. These features alone, not to mention the respective locations of the worms, are specific differences; probably when fresh specimens come to be examined morphological differences in the internal anatomy also will be recognised.

That this new parasite has a wide geographical range is probable. Dr. Catto informs us that he has recently received a section of intestine, prepared in a Japanese laboratory in 1900, which shows ova having exactly the same characters and occupying the same position in the intestine as in his own case. It is

certain, therefore, that the disease occurs in Japan, as well as in China, whence Dr. Catto's case came.

Dr. Catto offers an explanation of the reason why the existence of such a parasite has not been recognised before, which is probably correct. He says the ova in the stools have been mistaken for the ova of ankylostoma, which they resemble in size, shape, and general appearance. In searching stools for the ova of parasites a low magnifying power is used and a critical examination of each egg is not generally made; now that Dr. Catto has pointed out the necessity for a more careful scrutiny it is very possible that the ova of the new schistosome may frequently be encountered in Asiatics. We trust observers in India and China will bear this in mind, and also act on Dr. Catto's hint to examine scrapings from the surface of the bowel in patients who have died from chronic enteritis with or without ulceration.

There can be no question now of the existence of two species of schistosoma in men. We have long thought that there might yet be another species, namely, that which produces the lateral-spined ova, found only in bilharzia disease of the rectum. The explanation usually given is that the lateral position of the spine in the bilharzia ovum is merely an anomaly or accidental occurrence; this is not entirely satisfactory. It is difficult to understand why the same species of parasite should produce a terminal-spined ovum when it attacks the bladder, and a lateral-spined ovum when it attacks the rectum. Observers should endeavour to ascertain if the rectal bilharzia be not a distinct species with a special habitat and producing a special form of egg. To establish or confute this hypothesis parental forms must be sought for in the blood-vessels in the rectum. Hitherto it has been believed that *Schistosoma hæmatobium* lives in the venous system, especially the portal. Dr. Catto appears to have shown that the new schistosoma occurs both in arteries and veins; might it not be that *Schistosoma hæmatobium* has a similar distribution?

So far we have had no adequate explanation as to how the parental bilharzia, living in the interior of the blood-vessels, manages to deposit her eggs outside the vessel. The eggs cannot attain this position by being carried by the blood stream to the capillaries of the bladder; the blood stream sets in the opposite direction. The parent worm must somehow pierce the walls of the vessel; how it succeeds in doing this has yet to be explained. In the case of Dr. Catto's parasite the remarkable uniformity of the layer of eggs in the mucous membrane, as illustrated by his photomicrograph of a section of the appendix, is difficult to explain. The eggs are not in the capillaries—which they are too large to enter—but they may be in the lymphatic spaces, and possibly we may get an explanation of their singularly uniform distribution when we know more about the direction of the lymph currents in the bowel.

The remarkable position of the female worm, lying as she does embraced by the male, the cephalic ends of each diverging like the branches of a tree, suggests that such an arrangement, observed in both species of schistosoma, has some definite purpose. We would suggest that this purpose is the plugging of the vessels during the act of oviposition. When the ova in the gravid female are mature the worms, male and female, migrate along the blood-vessels until they are brought up at the bifurcation of the smallest vessel their size permits them to enter. Arrived here the head of the male enters one branch and plugs it, while the head of the female enters and plugs the other. Thus hæmorrhage would be prevented when the female, by means of some apparatus not yet recognised, pierces the wall of the vessel, and through the small hole so made ejects her ova into the perivascular tissue, whence they are distributed by the lymph stream.

The presence of integumental bosses in the male worm in *S. hæmatobium* and their absence in *S. Cattoi* probably has reference to their respective positions in the circulatory system; the latter lying principally in the arteries, the current of blood maintains the worms in their proper position, but in the case of *S. hæmatobium* the current would tend to carry them away during oviposition were it not that the male or outer worm has a rough integument by which to adhere to the vessel walls.

The mode of acquisition of bilharzia is still unknown. Possibly Dr. Catto's discovery may in time throw some light on this point, which is a most important one, seeing that it has a direct bearing on prevention.

However these things may be, Dr. Catto's discovery, for which he has been awarded the Craggs Prize, and on which we heartily congratulate him, cannot fail to suggest many interesting problems both in natural history and pathology.

THE DESTRUCTION OF MOSQUITOES.

(Extracts from "An Account of the Drainage and other Works Carried Out with this Object during 1902 and 1903 at St. Lucia, West Indies.")

By Major W. M. Hodder.
Royal Engineers.

Major Gorgas, Medical Corps, U.S. Army, on the Stamping Out of Yellow Fever in Havana.

When we commenced work in Havana, the Island had been suffering for five years from an exhausting civil war, and during the few months preceding the city had undergone a blockade by the American fleet. The hygienic conditions of the city were, therefore, at that time, considerably worse than they were in normal times. But the non-immune population was small; immigration had dwindled during the war, and had practically stopped for the year preceding.

We went to work on the usual sanitary lines, with our efforts directed more particularly toward yellow fever. I will not attempt any description of the general sanitary work, but describe the methods adopted toward yellow fever.

Up to July of the first year of American occupation, we had little yellow fever in the city. Then immigrants began to pour in, and some 16,000 reached Havana between July and December 31st in the year 1899. From July to December 31st we had quite an epidemic of yellow fever, and December of 1899 was the severest December, as regards yellow fever, that had occurred for years.

In February, 1900, I was appointed the Chief Sanitary Officer for Havana, and I know from personal observation that from that time the regulations with regard to yellow fever were carefully carried out.

The reporting of yellow fever was compulsory. Upon the report of a case, it was promptly isolated and quarantined by guards employed by the Sanitary Department. No communication whatever was allowed within the quarantined area, except that of the visiting physicians and the sanitary inspector. All supplies had to pass through the sanitary guard. The isolation was as complete as military authority and liberal expenditure could make it. The case was then referred to a Board of experienced physicians, who visited the patient and made the diagnosis. When the case terminated in death, the body was buried with the usual sanitary precautions adopted in highly dangerous diseases. In all cases the quarantined area was disinfected: first by carefully wiping down everything with a bichloride solution, and then by filling all rooms with formalin gas, using a litre of the 40 per cent. solution to each thousand feet of space disinfected. Fabrics of all kinds were taken to the steam disinfecting plant and there disinfected. Under this system we hoped to decrease yellow fever greatly, and in the course of a few years to eradicate it from the city.

The general sanitary measures adopted appeared to be rapidly decreasing the general death-rate. The general death-rate in 1898 was 91·03 per thousand; in 1899 it fell to 33·67, and in 1900 continued to decrease to 24·40. But our work apparently had no effect upon yellow fever.

The winter epidemic of 1899 continued through the spring and summer, reaching in the fall the proportions of a sharp epidemic, even for Havana. We had during the year 1900, 1,244 cases of yellow fever with 310 deaths. All classes suffered, particularly the higher officials on the Military Governor's staff. The Chief Quartermaster of the Island, the Chief Commissary for the Island, and one of the aides of the Military Governor died of yellow fever.

The Sanitary Department was much discouraged at the result of the work. It seemed to me that general sanitary measures could not be more extensively carried out than we had done during this year. We had all the power of the military authority behind us, and ample means. During this year, on the internal sanitation of houses, exclusive of street cleaning, disposal of garbage, &c., we spent about 25,000 dols. per month, and employed some 300 men daily. The general sanitary conditions were improving in the most satisfactory manner, but we evidently had not produced the slightest effect upon yellow fever.

We commenced 1901 much discouraged, with the most unfavourable outlook as far as yellow fever was concerned. The non-immune population was larger, probably, than it had ever been before. Twenty-four thousand immigrants had come into Havana during the year 1900. Yellow fever was in every part of the city. The deaths from yellow fever in January and February were large, and the probabilities all pointed to our having a more severe epidemic in 1901 than in 1900.

The results of the investigations by the Army Board of the theory, first advanced by Dr. Charles Finlay, that the Stegomyia mosquito was the only carrier of yellow fever were published about this time. This work was so brilliant in its execution and so positive in its results that, as I look back now, I am surprised that I was not at once convinced. But many years of contact with men engaged in the practical work of managing yellow fever, and my own personal experience with this disease, had so impressed me with the belief that *fomites* were the principal and, practically, the only carrier of the disease that I had scant belief in the mosquito theory. But General Wood was determined that every possible measure should be taken for the reduction of the disease, and he authorised me to go to any reasonable expense in providing for the destruction of mosquitoes, which I then considered only a possible and exceptional means of transmitting yellow fever.

But having undertaken it, the Department bent every energy to carrying it out thoroughly, and as I look back, I have the satisfaction of believing that we could not have carried it out more thoroughly even if we had known that the results would be what they have been.

In looking over the ground beforehand, we concluded that for practical operations three fields of work had to be considered.

In the first place, to destroy all the Stegomyia we could, so as to limit the number of insects capable of conveying the disease. For it seems obvious that if we had no Stegomyia we should have no yellow fever.

In the second place, to prevent the Stegomyia from biting the yellow fever patient; because, if we could prevent the mosquito becoming diseased, we would also prevent yellow fever.

And in the third place, to destroy all mosquitoes that had bitten yellow fever patients and thus become infected; because if these are destroyed, it is evident that the disease would be stopped.

With the object of reducing the number of mosquitoes an ordinance was issued requiring all people within the city limits to keep receptacles containing water mosquito proof. The city was divided up into districts, and an inspector appointed for each district, who kept up a constant inspection with the view of enforcing these ordinances. He was accompanied by men with oil-cans to oil all puddles, cesspools, &c., about the dwellings, and, after sufficient notice had been given, to destroy all receptacles in which larvæ were found. All persons having larvæ on their premises were fined under the municipal ordinances. Fifty men were employed in this work. One hundred men during most of the summer were employed under proper superintendence in the suburbs, draining all pools and low ground and oiling such places as could not be drained; that is, during most of the past summer 150 men devoted their attention to killing mosquitoes in the larval stage.

To meet the second proposition, that is, to keep the Stegomyia from biting the infected man, all hospitals where yellow fever was received were ordered to be thoroughly screened, and this was at once enforced. In cases of yellow fever occurring in private houses, the Sanitary Department screened them at public expense. Ordinarily, within two hours after the report

of a case of yellow fever, the quarantined area was thoroughly screened. We kept a sufficient number of ready-made screens on hand for the purpose, and thirty men were employed in this work.

To meet the third proposition, that is, killing the infected mosquitoes, the infected building and all adjacent buildings were gone over from top to bottom with pyrethrum powder; 150 pounds on the average were used in each case. This work was done in addition to the disinfection carried out the preceding year.

While pyrethrum powder is not as good a mosquitocide as some other substances, it is the least objectionable to the people whose dwellings are being fumigated. It causes no injury to fabrics, and within four or five hours the room can be again occupied without discomfort. It, however, does not kill all mosquitoes. A good many of them are simply intoxicated, and will revive if exposed to fresh air. For this reason the mosquitoes have to be carefully swept up and destroyed. We then went through the whole month of June, up to July 21st, before we had another case. The houses contiguous to the infected house were gone over in the same way on the possibility of infected mosquitoes having escaped to neighbouring houses. Every room was carefully sealed and pasted, just as we had done in using formalin. In this work some forty men were employed during the summer. We used a pound of pyrethrum powder to each 1,000 cubic feet of air space.

In January, 1901, we had twenty-four cases of fever, with seven deaths, a large number for that month; in February eight cases and five deaths.

The mosquito work was inaugurated February 27th. We went through March with only two cases, which occurred on the 2nd and 8th. I was much pleased with this, but not particularly impressed, knowing that it might be a coincidence. We then went to April 20th without another case. This was unexpected, particularly as the year had commenced so badly, and as there was plenty of non-immune material around. The Table will show that this condition of affairs had never been approximated before in Havana. On April 21st and 22nd we had two more cases, but under our system of disinfection it did not spread. I began to feel pretty certain by this time that the results were due to our mosquito work. On May 6th and 7th we had four more cases, but this focus was promptly controlled. We then went through the whole month of June, up to July 21st, before we had another case.

It was exceedingly important to have all cases reported, so as not to let a focus get started and spread. A great element in the reporting of cases was to have as little opposition as possible on the part of the people. The fumigation for the mosquito caused very little inconvenience, compared with the disinfection of fomites; and after much discussion and deliberation with the officers in charge of the disinfecting work, I determined, the latter part of June, to do away with all sanitary measures against yellow fever, except those directed towards the mosquito, as the only means of the transmission of the disease.

These measures went into effect July 1st, and after that time nothing was sent to the disinfecting plant in yellow fever cases; and at the infected point, only measures looking to the destruction of mosquitoes were taken. The guard was still kept at the infected house, but the physician was allowed to specify a reasonable number of immunes who might go to and from the quarantined area. The guard was directed to see that the screen doors were kept closed, and that the ordinary sick-room hygiene was carried out.

About the middle of June a pronounced focus of yellow fever developed in Santiago de las Vegas, a town out twelve miles from Havana. The successful management of this focus was another evidence of the efficacy of the methods adopted in Havana, but the length of this paper does not allow me to go into details of these cases. Santiago de las Vegas is a town of 5,000 inhabitants, with a non-immune population of 475. It is really a suburb of Havana, and considerable numbers of people come and go every day.

Besides Santiago de las Vegas, there were three or four other towns with direct communication that were having yellow fever about this time.

We discovered 9 cases that came into the city of Havana from Santiago de las Vegas during June, July and August. As Havana had been entirely free from yellow fever during June, I am inclined to think that Santiago de las Vegas was the point from which we became reinfected.

During July we had 4 cases in Havana, with 1 death; during August 6 cases with 2 deaths. Becoming satisfied that we were being reinfected from outside towns, I obtained authority from the Military Governor to place inspectors on all railroads coming into Havana from infected points. These took the names of all the non-immunes coming into the city, and kept them under observation for a week. This worked very well in practice. All the cases known to have come into the city were reported by these Inspectors.

As the infection was severe in Santiago de las Vegas, an appropriation of $4,000 was made for the purpose of stamping out the disease there. We adopted the same methods there as in Havana, and at once controlled the disease. The last case occurred in Santiago de las Vegas August 31st. A case from this point was reported October 14th, but I, personally, do not think it was a case of yellow fever. It was an exceedingly mild and doubtful case, though diagnosed as yellow fever by the Board.

On September 28th we had our last case in Havana. During October, November, December and January we had none.

The whole year has been very unusual in its yellow fever conditions, and is far below any preceding year of which we have record in the number of cases which have occurred. October and November have always been months when yellow fever was rife in Havana, and to have had none at all in these months in 1901 is remarkable.

During 1900 the general death-rate had been greatly lowered by the sanitary work done, but yellow fever had not been much affected, and we had a sharp epidemic.

In 1901 all the conditions were unchanged, except that work for the destruction of mosquitoes was

carried out, with the result that yellow fever at once almost disappeared, and really did disappear in the last three months of the year.

I submit this as evidence of the practical demonstration of the "Mosquito Theory."

It will be seen that the result of the above measures was the stamping out of yellow fever from Havana, where no cases (except those imported) have occurred from October, 1901, to November 30th, 1903. But although the disease has gone, the labours of the Sanitary Department of Havana have not ceased, the extracts given above amply testifying that up to the present time this Department and the Superior Board of Health for the Island of Cuba are taking every precaution and acting with promptness and vigour at every point.

The deduction I make is that, with a comparatively small expenditure of money, but with a very careful organisation, the difficulties of wiping out this disease from the face of the earth do not appear insuperable.

The great success attained in Cuba in stamping out yellow fever would at first sight lead one to suppose that the same results could be obtained in the cases of malarial fevers.

But on investigation of the conditions which produce malaria, it will clearly be seen that such is very far from the truth. Mitigation of these diseases is all we can hope for; but at the same time, by the method to be described later on, almost any locality of a limited size, no matter how unfavourably situated, can, by sufficient expenditure of money and proper organisation, be rendered almost (if not quite) free from the class of mosquitoes which carry the microbe of the disease, and consequently from the disease itself.

The reasons why malaria cannot be stamped out appear to me to be as follows:—

(1) The patient remains a source of infection for many days, perhaps years; for the disease, as is well known, may be dormant in the system for a very long time and may break out in non-malarious countries without any fresh infection.

(2) The inhabitants of malarious districts are not immune, but are generally saturated with malaria from their birth; although they do not, as a rule, get such severe attacks as Europeans, yet they constitute a permanent reservoir of infection.

(3) There is, on the face of the earth, too vast an extent of swamps, where exists the combination of an infected native population and the Anopheles mosquito.

Notes and News.

The next Australian Medical Congress is to be held in Adelaide in September, 1905.

The "Sanitas" Company, Limited.—The annual general meeting (27th in number) of the "Sanitas" Company, Limited (disinfectant manufacturers), was held on the 22nd inst., at their new premises in Locksley Street, Limehouse, London, E., under the presidency of the Chairman, Mr. C. T. Kingzett, F.I.C., F.C.S., who congratulated the shareholders upon the continued prosperity of the business and their prospects for the future. Although the past year had not been by any means a favourable one to their class of business in particular, and was generally recognised as a poor one in respect of the general trade of the country, the business had continued to expand, and their sales were greater than in any previous year. Their manufactures included practically all kinds of disinfectants and many sanitary appliances, and "Sanitas Fluid" still easily held first place as a non-poisonous and effective disinfectant for household and sick-room purposes. The balance to credit of profit and loss account, after making provision for bad and doubtful debts, repairs to plant and machinery and other charges and contingencies, adding the amount brought forward from 1903 of £2,227 9s. 7d. and deducting income tax, amounted to £15,582 12s. 5d.

Remedies.

Diphtheria. — Swab throat with perchloride of mercury solution 1 in 1,000, or 1 in 500, and when patient is old enough gargle with chlorinated soda or 4 per cent. solution of formalin (Sir Lauder Brunton in *Clinical Journal*, February 15th, 1905). Russell Rundle has employed formolyptol as a spray, as a gargle and as internal remedy in 2 minim doses for diphtheric throat with marked success (*Lancet*, February 15th, 1905).

Medical News.

Mortality in South African Mines.—The comparative death-rate per 1,000 between native and Chinese labourers in the South African mines from August to December, 1904, was as follows: August, 37 deaths per 1,000 natives, 14 Chinese; September, 40 natives, 25 Chinese; October, 51 natives, 22 Chinese; November, 56 natives, 28 Chinese; December, 53 natives, 27 Chinese. The number of Chinese employed in the mines during the last six months of 1904 were respectively: July, 1,388; August, 4,945; September, 9,020; October, 12,965; November, 17,469; December, 20,885.

Medical School for Singapore.—An earnest endeavour is being made to establish a medical school in Singapore. The Hon. Tan-Jick-Kim is interesting himself in the raising of funds for the endowment of the school, and it is to be hoped the scheme will prove successful. Should a sum of about £7,000 be got together the Straits Settlements Government is prepared to provide a building and to equip it for teaching purposes.

Dysentery due to Bacillus Dysenteriæ Falling on Conjunctiva.—Charles Dodge, Rochester, New York, states that an assistant in a laboratory broke a test-tube containing cultures of the *Bacillus dysenteriæ* (Shiga). Some of the material is reported

to have touched the eye, Within twenty-four hours typical dysentery resulted. The occurrence may have been a coincidence, but if not, the possibility of direct infection of dysentery in man by the bacillus is brought within the area of practical pathology.

Leprosy in Bengal.—There are reported to be upwards of 35,000 lepers within the Province of Bengal.

Plague disturbs educational life in India in many ways. The native schoolboys, anxious for holidays as all schoolboys are, petition their masters from time to time to close the schools. In one school, where hesitation on the part of the schoolmasters was apparent, the scholars bought dead rats in the town and left them about the school premises in order to create a panic to further their petition for holidays. At Allahabad, the Senate of the University have for the past few years deferred the spring examination on account of plague, and the students have yearly doubts as to whether or not the spring examinations are really to come off. It would surely be better to definitely announce that until further notice the university examinations are to be held in the summer, when plague is less dreaded.

Reviews.

A Manual of Surgical Diagnosis, By James Berry, F.R.C.S. London: J. and A. Churchill, 1904.

Before starting for the Tropics see that this excellent manual is amongst your stock of books.

Trypanosomes et Trypanosomiases. By A. Laveran and F. Mesnil. Paris: Masson.

This comprehensive work deals with all that is known on the subject at the present time, and is a notable addition to the excellent publications of these distinguished authors. The chapter devoted to the technique of clinical investigation is characterised by an account of the best methods of investigating the parasites with, as well as without, staining, by culture and inoculation.

The trypanosomes known to occur in all branches of the animal kingdom, including birds and fishes, are dealt with, including their geographical distribution. As a result the work is an indispensable adjunct to veterinary works in all countries.

The part describing the parasites in man includes the symptoms they produce, diagnosis and prognosis. As to treatment, unfortunately nothing is of use except to place the patient in the best condition to maintain the general health.

Considering the extensive ravages of sleeping sickness, its protracted incubation, no efforts should be spared to prevent it. Bearing in mind its rapid spread under British rule—if, indeed, its spread is not a result of British rule, as in Uganda—the prevention of trypanosomiasis demands further consideration at the hands of those answerable for the government of our colonies. By no means the least pleasant feature of the book is the generous credit given to British workers in this important subject.

The study of this work is a pleasure in store for all practitioners in districts where trypanosomes exist, and a duty incumbent on all engaged in pathological work.

Considering the seriousness of trypanosomiasis, one may be excused for throwing out a suggested line of investigation. Injections of normal human serum have been made into animals infected with trypanosomiasis, but not injections of syphilitic serum. What are the effects of syphilis and trypanosomiasis in the same subject?

T. P. B.

Impaludismo. By Dr. Francisco Fajardo. Imprensa Nacional, Rio de Janeiro.

Francisco deals briefly but clearly with the various aspects of malaria, both acute and chronic, with their pathology.

The part dealing with mosquitoes is an epitome of the most recent literature, and contains excellent illustrations from Low, Theobald, and others; in fact, the illustrations are a marked feature of the work, which compares favourably with those printed in Europe.

The part dealing with intercurrent diseases is of supreme interest, especially the combinations of typhoid and malaria, and malaria and beri-beri, for the experience of the Brazilian physicians is instructive from their experience of acute beri-beri in a country where rice is rarely used. Other combinations which vitally affect the prognosis in malarial districts are fully described. On the subject of diagnosis and treatment many useful hints are given, reliance being placed on hypodermic or intravenous injections of quinine.

The temperature charts of tuberculosis and influenza show the possibilities of mistaking these diseases for malaria.

The work is one of the most practical manuals on malaria to be found in any language, and will be of material assistance to Portuguese-speaking physicians in Europe, in the Portuguese colonies of Africa and India, as well as in Brazil.

T. P. B.

Geographical Distribution of Disease.

As information arrives we publish, under this heading, the principal diseases met with in tropical and sub-tropical countries, so that those interested in the Geographical Distribution of disease may have a means of gathering information concerning the prevalent ailments in different parts of the world.

Yellow Fever.

Panama.—Seven cases of yellow fever were reported from the Panama district in December, 1904, and three cases occurred between January 1st and 10th, 1905.

Mexico.—The President of the Superior Board of Health of Mexico announces that, as a result of the campaign against yellow fever, there is not a single case in the country at present.

United States of America.

On the arrival of the steamer *Abby Palmer* at Marcus Hook on January 8th from the Hawaiian Islands, two members of the crew, an Englishman and a Swede, were found suffering from beri-beri.

Plague.

PREVALENCE OF THE DISEASE.

India.—During the weeks ending January 7th, 14th, 21st and 28th, the deaths from plague numbered 24,385, 24,385, 28,104 and 33,087, respectively.

South Africa: Port Elizabeth.—Weeks ending January 7th, 14th, 21st and 28th, fresh cases 0, 1, 0 and 0; deaths 0, 1, 0 and 0. *East London.*—Fresh cases 7, 1, 0 and 0; deaths 3, 2, 0 and 0.

Mauritius.—During the weeks ending January 26th and February 2nd, 9th and 16th, fresh cases 8, 9, 5 and 6; deaths 6, 7, 2 and 5.

Hong Kong.—During the weeks ending January 21st, 28th, February 4th, 11th and 18th, fresh cases 3, 3, 4, 5 and 2; deaths 3, 3, 4, 3 and 2.

Russia: Province of Viatka.—Between January 5th and 11th, 14 cases.

Siam: Bangkok.—Up to February 3rd, deaths amongst Indians 12, amongst Siamese several deaths.

Burmah: Rangoon.—On February 11th, 4 cases reported.

Aden.—During the week ending January 21st, fresh cases 110; deaths 83.

Egypt: Suez.—During the week ending January 28th, fresh cases 2.

British East Africa: Port Florence.—During week ending January 12th, fresh cases 9; deaths 8.

England: Liverpool.—On board s.s. *Crewe Hall*, Lascar died on January 31st.

Australia: New South Wales.—In a district 300 to 400 miles up the Clarence River from Sydney, 2 deaths from plague occurred during first week of January.

Queensland: Brisbane.—January 2nd, 1905, 1 death from plague; previous death occurred September 15th, 1904.

Formosa.—During November, 1904, fresh cases 81; deaths 76.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"British Medical Journal," February 11, 1905.

1. On the Pathology and Treatment of Leprosy. By Captain E. R. Rost, I.M.S., Resident Medical Officer General Hospital, Rangoon.

2. The Cultivation of Liquorice in Mesopotamia.

(1) Rost, in a paper read before the Burmah Branch of the British Medical Association and published in the *Indian Medical Gazette* for May and June, 1904, states that in August, 1903, he succeeded in cultivating the leper bacillus rapidly. He found that the presence of sodium chloride in the cultivation medium prevented the growth of the tubercle and leper bacillus, and he therefore prepared a medium by distilling beef extract, in which both bacilli grew readily. This nutrient material was further improved by passing a current of superheated steam from the autoclave on a boiling beef extract, and still further improved by pressing superheated steam over the beef extract soaked in pumice-stone in bottles inside the autoclave. In this medium the tubercle bacillus grew in from one to three days, and the leprosy bacillus in from three to five days. To obtain a solid medium in which to cultivate the bacillus, Rost, by dialysing nutrient agar in frequently changed warm distilled agar, obtained a nutrient agar entirely free from sodium chloride.

In the manufacture of the toxin of the *Bacillus leprœ*, named by Rost leprolin, the original method described by Koch for tuberculin was followed, except that Rost did not sterilise the cultures at all. Leprolin is being employed in the treatment of leprosy in some thirty different places in India. The local and general signs and symptoms caused by leprolin injections closely resemble tuberclin injections. Great improvement in the condition of the leper resulted from the use of leprolin. Two views as to the manner in which leprolin may act are quoted by Rost. One is the autotoxic view, which claims that all cultures of bacteria eventually die out by poisoning themselves by their own excreta; the other the antautotoxic theory, which presumes that, if a bacterial poison is injected into the body, the body reacts to it in such a way that an antitoxin is eventually formed in the body which acts as an antitoxin and kills off the bacilli. In the latter instance the leprolin serves as an antitoxin, and acts as an antidote to the bacilli and their poisons.

"Medical Record," January 7, 1905.

Spleenless Men. By J. H. Carstens.

Carstens considers that the chief indications for complete removal of the spleen—splenectomy—are: (1) Splenic anæmia, so-called; (2) injury; (3) malignant disease. He reports two splenectomies, one for splenic anæmia and one for sarcoma: both patients recovered. Spleenless men can live in perfect health; no changes in the blood seem to result from removal of the organ.

"Lancet," February 18, 1905.

1. Sabouard's Method of Ringworm Treatment. By J. L. Bunch.

2. The Indian Medical Service. Editorial.

(1) Bunch relates the plan of treatment he has observed at the Hopital Saint-Louis in Paris by Sabouard. The great difficulty hitherto in treating ringworm by X-rays has been the destruction of the brain and injury to scalp during the treatment. This is now guarded against by Sabouard's method. The apparatus employed is an electric current, constant and alternating, and a Crookes tube. The electric energy can be derived from a static machine, a Ruhmkorff cell, or a transformer; the Crookes tube may be of any pattern or any age. The "hardness" and "softness" of the tube may be provided for by a modification of Villar's method.

The quantity of the X-rays generated in a given time is estimated by the use of paper covered with an

emulsion of platino-cyanide of barium, which, when placed within the area of the X-rays, changes in tint and indicates, by comparison with a prepared coloured chart, the quantity of X-ray present. To cure a patch of ringworm it must be exposed at a distance of fifteen centimetres from the Crookes-Villars tube. After the seventh day local changes occur; on the fifteenth day and onwards the hairs fall out, and new healthy hairs succeed.

(2) The Indian Medical Service is made the subject of an editorial, and it is plain that the whole subject of the relation of British and native practitioners of medicine in India will become acute at no distant period.

The editorial states that, "It goes without saying that Europeans serving in India will always prefer medical men of their own race." Any one who knows medical life in our Colonies is quite well aware that medical men of their own race are not always preferred by British residents. We know several excellent practitioners of Asiatic origin who attend upon European families in our Colonies. We find no fault with this, it makes for unity of empire; but it is a fact that the officers of the Indian Medical Service have to bear in mind.

"The Australian Medical Gazette," January 20, 1905.

1. The Summer Diarrhœa of Children. By W. Morrison, M.D.

2. The Relation of Shiga's Bacillus to the Summer Diarrhœa of Infants. By W. F. Litchfield, M.B., and P. L. Hipsley, M.B.

(1) Morrison, after referring to the prevalence of summer diarrhœa amongst children in Australia, classifies the ailments into the catarrhal and the inflammatory or dysenteric types. The etiological factors are dentition, diet and atmospheric conditions. Treatment, Morrison discusses under three heads: (*a*) Dietetic. Milk is to be stopped, and weak mutton broth, barley water, white of egg, sherry, whey, thin arrowroot, fresh meat-juice, and shredded raw meat do good. (*b*) General. Warm compresses to the abdomen, warm baths and Dover's powder are recommended. (*c*) Medicinal. Calomel in repeated doses and castor oil are to be given at first, followed by salol, liquor hydrargyri perchlor., or occasionally carbolic acid. Salines, with or without rhubarb, Dover's powder or bismuth, and Angier's petroleum emulsion, have in Morrison's practice prove useful.

(2) Litchfield and Hipsley have succeeded in isolating Shiga's bacillus in three cases of diarrhœa in children in Sydney, and obtained a specific agglutination reaction in a number of other cases. The first case in which they isolated the bacillus was in the stools of a child aged nine weeks, in March, 1903.

"Annales de l'Institut Pasteur," January, 1905.

ENDEMIC PLAGUE, CLIMATIC BUBO, AND INFECTIOUS LYMPHANGITIS.

Recent investigators have confirmed the view Dr. Thiroux propounded in 1899 of the identity of these affections, including the white erysipelas of Brazil characterised by swelling of the skin and subcutaneous tissue—a more fatal disease than ordinary erysipelas.

"Le Caducée," February 18, 1905.

TREATMENT OF YELLOW FEVER.

J. Dupuy is in favour of alkaline treatment, which removes the toxins from the liver and kidneys and is of prognostic value; for if the urine becomes alkaline, recovery is practically assured.

Internal treatment: Bicarbonate of soda, 15; sugar, 10; distilled water, 450. Two tablespoonfuls every hour, sweetened with syrup of vanilla, if desired. Vichy water as desired, with or without ice.

External treatment: A six-pint enema of half per cent bicarbonate of soda.

Tepid baths two or four a day, according to the temperature.

If there is vomiting, give fifteen drops of tincture of opium in three or four divided doses in an effervescing mixture, while continuing the ordinary treatment.

"Le Caducéé," January 21, 1905.

Les Infirmeries indigenes en Algérie (Native Hospitals in Algeria). By Granju.

At Palestro a special building was constructed and whitewashed inside and out, the floor formed of lime and furnace clinkers covered with bricks dipped in oil. The internal partitions were made of bricks.

The building was in the form of a parallelogram, with a central corridor along the short axis, and a verandah running all round.

There was a separate shed for a wash-house with a tiled bath. There was a European male nurse. At Oran the nurses were natives, and the building was constructed on the native plan, a central court on which all the rooms opened.

At Ain Bessem a house was hired for forty francs a month, with all the rooms on the ground floor. They included a consulting room, operating theatre, two wards for men and one for women. Each ward was capable of holding four patients, two in beds and two sleeping on mats under rugs. The nurse sleeps in the consulting room, and attends to both in- and out-patients.

The food, supplied by a contractor for 60 cents. a day, consists of meat, vegetables, bread or native cakes, or a couple of eggs and bread or milk, four pints a day, or a pint at each meal with bread.

In nine months fifty cases were treated, one-fifth children. The average stay was 12·7 days. Half the cases were venereal. The cost was 1 fr. a day, against 2 fr. 15 for men and 2 fr. 45 for women in a neighbouring hospital.

T. P. B.

Notices to Correspondents.

1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the JOURNAL OF TROPICAL MEDICINE should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communications.

INTERESTING CASE OF MYCETOMA IN CYPRUS.

By G. A. Williamson, M.D.Aberd.

This disease, also known by the name of Madura Foot and Fungus Foot of India, was formerly supposed to have a very limited geographical distribution, being found in India, Senegambia, Straits Settlements, East Africa, British Guiana, and Cuba; a very few cases being also found in Algeria, the Soudan, Cochin China, Italy, the United States, and South America. To this latter list the following case would seem to warrant the addition of Cyprus.

Arif Hussein, December, 1903.
Photograph taken on admission to Hospital.

History of Case.—In December, 1903, Arif Hussein was admitted to Larnaca Prison, at which date his condition is shown in photo. The chief features of the case are: (1) Hard, non-pitting swelling of the foot; (2) a large number of sinuses discharging a slight amount of pus, and also the "fish-roe granules" so characteristic of the disease; (3) discoloured portions of skin of the foot; (4) deformity caused by the swelling, the toes being widely separated, and not touching the ground on the patient's standing up.

This man, now 35 years of age, was born and lived (with the exception of a few days' residence in different parts of the island) in the village of Menoyia, in the district of Larnaca. He is a shepherd by occupation. About eight years ago he noticed on the sole of the foot a hard swelling, which he thought was caused by pressure from his boot; this swelling was the size of a pea when first noticed, and was painless; it slowly got larger and grew in a year's time to the size of a hazel-nut, when it began to give pain. About two years after the first appearance of the hard nodule the swelling extended to the whole foot. At that time the patient applied leeches on three occasions, and he thought the swelling got much larger soon after the application. During the last five years the foot has not, he thinks, enlarged further. He never had medical treatment.

Bacteriology. — The *Streptothrix maduræ* appears under the microscope as a mass of branching filaments, the ends of the filaments being frequently thickened; it stains readily with aniline colours, and retains its colour with Gram's stain.

Photograph taken at Kophinon on May 24, 1904, showing condition of diseased foot.

The greatest difficulty is frequently experienced in obtaining the streptothrix in *pure* culture, but I was fortunate enough to be successful in this. On nutrient agar-agar from the fish-roe granules a luxuriant growth was obtained. At first this was of a dull white colour, and appeared only after seven days' incubation at 37° C.; the growth was opaque, firmly adherent to the surface of the medium, and composed of a large number of rough, limpet-shaped projections. On the thirteenth day of incubation the colour changed to pale pink, deepening gradually, until by the eighteenth day it had become a dull red-pink (smoked salmon tint), which colour the growth still, six months after inoculation, retains. Subcultures made on nutrient agar-agar showed similar growths, except that the red colour was not apparent; film preparations, however, of the original culture and of subcultures showed no morpho-

logical difference between them. This growth on agar is similar to that described by Vincent (who grew the parasite from a case of the disease in Algiers), and by Boyce and Surveyor, except that the latter describes the growth as dull white only.

On gelatine and on glucose glycerine gelatine media the streptothrix did not flourish; the minute granules inoculated appeared to increase on the surface, causing a slight projection, but not spreading on the surface of the media. The bouillon cultivation became contaminated, and so the results are not available.

Conclusion.—The patient left for his village as soon as his period of imprisonment was completed. I was anxious to try the effect of prolonged exhibition of potassium iodide, though it appeared probable that only the radical cure of amputation would have any result.

This case is of very special interest as showing that the infection occurred in Cyprus, the patient never having been out of the island, and also as showing how correct was the surmise of Manson and Daniels that further examination would prove the much wider prevalence of the disease than that usually quoted. The absence of other cases in Cyprus shows the disease to be of great rarity in the island, though perhaps further search, *and microscopical examination*, may reveal additional instances of its existance.

The photographs show the appearance well.

ENDEMIC ENLARGEMENT OF OS CALCIS. PREVALENCE IN FORMOSA.

Operations for Relief.

By James L. Maxwell, M.D.Lond.
Tainan Mission Hospital, Formosa.

[Addressed in the form of a letter to the Editors.]

I have read with great interest the article in the November 1st, 1904, number of the Journal of Tropical Medicine, entitled, "On an Endemic Form of Enlargement of the Os Calcis."

My interest in it is due to the fact that a disease of somewhat similar nature, though of a much milder and more chronic type, seems to exist in the Island of Formosa.

The disease is rare—I have only seen six cases in all; but it occurs, I am told, in the central part of the island as well as the south, where I am stationed. The essential features consist in:—

(1) Slight enlargement of the posterior third of the os calcis. The enlargement, though slight, is quite unmistakable.

(2) Constant pain of a dull nature increased by pressure and by movement.

(3) Its occurrence in young males. All my cases have been in lads from 20 to 25 years of age.

The disease is essentially chronic in its nature, and has no acute onset such as Dr. Maclean mentions in the cases he describes.

The cases seem to be quite unbenefited by the exhibition of drugs such as pot. iodide, sodium salicylate, &c., &c., and, as far as I have seen, show little tendency to spontaneous cure. I mean, not that the os calcis goes on enlarging, but that the pain seems to get little better. Of course I saw the cases for a few months only, as, finding that I was able to do little good to them, they ceased to come for medicine.

There was no history of syphilis in any case.

Of the six cases, five were afflicted in both feet, one on one side only.

Two of the cases I took into hospital to see if further treatment would benefit them.

In the case of one I cut down on the heel from the outer side and divided the periosteum freely, thinking that the cause might be a little chronic periostitis. The wound healed at once, and the patient thought the pain was a little easier, but did not press for an operation on the other foot, so I considered that the treatment must have done very little good.

The other case was the severest I have seen—a young man of 23, who was practically incapacitated from work by pain and difficulty in walking.

After some weeks in hospital without any benefit whatever, I cut down as before on the outer side of the heel, and drove a ¼-inch trephine through the bone to the inside, removing the disc separated. The treatment seemed to act like magic, the pain disappeared from the heel, and from the very next day the lad began to entreat me to do the other foot. When the one was quite healed I operated on the other in the same way, and though the result was not quite so striking in the second foot as in the first, still it afforded the patient great relief. He came up to see me in the out-patient room for six months after, gradually regaining the power to walk about with complete comfort, and then I lost sight of him.

I might add that the patients themselves could never suggest any cause for the onset of the pain, which, indeed, they were never able to date exactly, it seemed to come on so gradually.

January 30, 1905.

MEASLES EPIDEMIC IN FIJI DURING 1903.

(Reported in Colonial Reports for 1904.)

By the Hon. G. W. A. Lynch, M.B., B.S.Camb.
Acting Chief Medical Officer.

Origin and Spread.

During the year 1902 there had been in Fiji some cases of German measles, and at one period this disease was mildly epidemic in Suva and other parts of Fiji; there could be no doubt as to the nature of the disease, by reason of its short duration, mildness, and the absence of any symptoms of consequence, or sequelæ. In December, 1902, however, an undoubted case of true measles was brought to the Colony from New Zealand. The patient, a European adult female, was removed to the Colonial Hospital from the steamer, and there completely isolated for the full period. She was admitted to hospital on December 7th, and discharged on February 2nd, when she went to Levuka, her home. There were, so far as can be ascertained, no other cases of measles either in Suva or Levuka until February 13th, when a half-caste Fijian woman and child were seen in Suva; these patients both presented a copious measly rash, with high temperature, pains in body and limbs, and cough. It was learnt that, two or three

days before, a child, in a house two doors off, had a similar rash and symptoms. It was inspected, but there were then no signs of illness of any sort about it; it was practically well. On the following day the half-caste and the child were again seen; in both cases the temperature was normal, and the rash practically all gone. The cases were therefore considered to be German measles, similar to those which had occurred in 1902.

Facilities for Spread.

The locality in which these cases were seen is a very crowded one; people of many nationalities live there—Fijians, Samoans, Indians, and a variety of Polynesians and half-castes, with scores of children of these people playing in the street all day; the houses are small, and the people are constantly in and out of each other's houses; it is therefore not to be wondered at that any epidemic disease, once introduced, should spread with great rapidity, especially when the patient or patients, as is usually the case, have been ill for several days before they have sought advice.

No further cases, however, were seen or reported from there at this time, and the next case reported was on February 23rd, when two Fijians were seen in the gaol with apparent measles, and were taken to the Colonial Hospital and there isolated. These Fijians were men who were "indentured" labourers to a planter at Samabula, some four or five miles out of Suva, in gaol for a short period for labour offences. They were admitted to gaol over a week before from the plantation. There is said to have been some sickness on this plantation, which was put down as influenza, of which of late years there is always more or less in Fiji. No medical officer saw the cases, but six men were brought one day at about this time from the plantation to the hospital for inspection, all of whom appeared to be recovering from influenza of a mild type, with slight temperature and slight bronchial symptoms, but in no case was there any rash.

On February 26th the local practitioner at Suva reported two cases to the Chief Medical Officer, and another on February 27th: the cases on February 13th and 23rd had also been reported to him in due course. After February 27th cases began to crop up frequently at the gaol and among the police, mostly among Fijians, day by day, until by March 13th there were twenty-six cases isolated at the hospital, and fifteen cases had been reported from the town of Suva itself.

Dealing with the Epidemic.

On March 13th His Excellency the Governor gave leave to use the buildings of the gaol infirmary for casec of measles, and for a European to be employed to look after them under the direction of the Resident Medical Superintendent of the Colonial Hospital, it having been decided to send convalescents from the hospital there to make room for fresh cases. It was recognised that, if the cases at Samabula had been cases of measles, the epidemic must have had every opportunity of spreading thence inland; for it is a plantation on a main road inland, at which natives were in the habit of constantly stopping to see their friends who were at work; and, moreover, a number of people had been down from the mountain districts of Naitasiri and Colo East to see relatives indentured to this plantation, and had returned to their homes. Circulars were therefore printed and issued to all medical officers, warning them of the outbreak; and notices were sent to the schools in Suva, asking that special observation might be taken in order to pick out cases and report them.

On March 12th a case was reported from the plantation next to the one at Samabula, and information was received then that the disease had "been through" all the labour on the plantation.

On March 13th a special meeting of the Board of Health was held to report the epidemic, and to arrange such special measures as might be deemed requisite; and it was then decided to re-enact the regulations framed in 1898 for the same disease, and to issue the instructions, in English and Fijian, which were at that time issued.

These notices were reprinted and issued in large numbers, and distributed to every portion of the group.

Progress of Epidemic.

The first death was reported on March 5th; it occurred at the Colonial Hospital, and was due to enteritis following measles. The patient was a male adult Fijian. Another death was reported from a plantation at Samabula (a few miles outside Suva), from dysentery; it was not actually reported that the patient had had measles, but it was said generally that all the labour on this plantation had suffered, and he must therefore be included. It was also at about this date reported that, when the people on the plantation adjoining this one were ill, friends from a town on the Rewa River (Lutu) had been staying on the plantation, and had returned to their home, obviously thereby spreading the epidemic to all the inland towns of the Rewa and Colo East.

From this time (middle of March) cases were daily reported, especially from Suva, amongst all races, and from all classes of people; and by March 19th, there being forty-one cases in Suva, all the schools were, by order of the local authority, closed.

Cases now began to be reported from various districts outside Suva, beginning with the Lower Rewa, and gradually spreading to all parts of the delta of that river.

There was extreme pressure at the hospital at this time owing to greatly increased numbers, and also to the fact that the native students or dressers, steward, and some of the nurses became ill, so that an extra nurse was sanctioned by the Governor, and a substitute was engaged to take the place of the steward, who was also employed to look after those people who were sent to the depôt buildings as convalescents. At about this time also in Suva matters were serious owing to the very general nature of the epidemic. The majority of the armed native constables, police, gaol warders, and many of the prisoners were patients in hospital, and the lengthy period of convalescence tended not a little to increase the great inconvenience caused by the universality of the disease.

This extreme pressure lasted for about three weeks, from the third week in March to the end of the first week in April, when some improvement began to be manifest.

Outlying Stations Infected.

On March 25th a report was received of the occurrence of four cases at Lautoka, a large sugar centre at the north-west corner of Viti Levu: the disease appears to have been conveyed thither by natives who went from Kadavu to discharge a steamer there; and at the same time cases were reported from Beqa and Levuka. As it was now evident that the epidemic was general and must travel through the group, it was directed by the Governor that extra medical aid should be obtained without delay, and a cablegram was despatched to Sydney for three emergency medical officers to be sent down by the earliest steamer.

On April 1st reports of the spread of the epidemic to Lau and Cakaudrove were received (these provinces are the furthest off in the group, the latter in its most distant part being 200 miles and upwards from Suva), and increased numbers of cases were daily reported from various parts of the Rewa River from the two medical officers in that district.

Dearth of Medical Men.

The department was at this time short-handed, owing to the absence on leave of the Chief Medical Officer; and another medical officer (Dr. Hall) had just returned to the Colony from short leave, and was at once sent to Beqa, where there was also a native medical practitioner. On his return thence Dr. Hall was sent to the Upper Rewa, to inspect and report, and also to the assistance of the medical officer at Nubumakita, in Colo, who was reported by telephone to be gravely ill (not of measles). He was found to be so ill that his removal to Suva was absolutely necessary, and his services were therefore lost to the department during this urgent time, for he was, after a stay in the hospital in Suva, obliged to go away on sick leave to Australia.

The Commissioner from Colo East reported that the epidemic had practically "been through" the mountain towns of his district, and had been "mild"; but this opinion must be now regarded as optimistic, in view of subsequent results and figures, the apparent mildness having probably induced much carelessness on the part of the natives, and consequently severity of sequelæ, as will be seen further.

On April 5th two of the emergency medical officers arrived. On April 12th one of them was sent to the Ra Province with drugs, medical comforts, and an interpreter; and the Medical Officer of Ba (Dr. Hall) now returned to his own district. On April 15th the third emergency medical officer arrived, and left next day for Cakaudrove; and on the same day the second, who had been waiting for an opportunity, was sent to Lau.

His Excellency also about this time approved of the employment of a European resident of the Province of Tailevu, who had some knowledge of sickness, to look after the natives of that province; and at the same time two senior students were sent from the hospital, after recovery from measles, to look after natives, one in the Viria district on the Rewa, and the other to Navua for Namosi, a mountain province mainly.

Subsidence of Epidemic.

In Suva the epidemic was by this time (end of April) beginning to slacken, though reports from outside showed that it was still very severe in various parts. The medical officer sent to Ra returned to Suava on May 3rd, reporting that the epidemic was practically over there, and had been mild; but the same remark applies to this report as that herein made in relation to the report by the Commissioner of Colo East.

On May 4th the schools in Suva were reopened. Large numbers of cases were daily reported from all outside districts, with, in many cases, reports of deaths; but it is apparent that the reports were not at this time accurate, as will be seen on reference to the summary and table attached hereto.

The native assistant sent to Viria returned to Suva on May 11th, reporting that cases were doing well, and that instructions were being followed; and at the same time reports to much the same effect were received from the European emergency medical officer sent to Cakaudrove, and from the Provincial Inspector in that province.

Another native assistant (Manueli) was at about this time sent to Navua to look after the people of Deuba and Serua.

By May 18th very few cases were being reported from Suva; the hospital was very clear, only some eight or nine cases remaining there. While declining, however, in Suva and the parts around, outside reports were still of the spread to the furthest parts of the group, until there remained no district or village even in the remotest islands through which the epidemic had not spread.

On June 21st the Colonial Hospital was reported clear, and no cases had been reported in Suva since June 15th, and there was evidence then of a fairly rapid decline in most parts. The last case absolutely in Suva was reported on July 19th, and with gradual tailing off the last case from outside was reported on September 6th, since which date no cases have been reported.

The height of the epidemic, then, was during March, April, May, and June, of which March and April were the most serious months for Suva and the surrounding parts; while from April to June the outside districts suffered most severely.

Features of the Illness.

Type of Disease and Complications.—The type of the disease was on the whole fairly severe, more especially in the cases of adults. Children as a whole may be said to have suffered mildly, adults as a whole suffered severely—that is, as regards the disease itself. Many cases were returned as having had very high temperatures, up to 106° F., and the rashes seen were, even on the very dark skins, exceedingly well marked, sometimes petechial, and even almost purpuric, and persisting for many days after the fall of the temperature to normal. The native patients, even when closely looked after in hospital, suffered very severely from debility of a prolonged and severe type. Lung complications were comparatively infrequent; they occurred, of course, in all forms, but not nearly in such large numbers as

might have been expected in so widespread an epidemic. This comparative absence is no doubt due to the tropical climate. Patients, however, with incipient tubercular disease of lungs were found to have had their malady much advanced, even to a rapidly fatal issue.

Among other complications which caused trouble were severe and prolonged vomiting and acute mania; one patient was admitted maniacal and died, his mania having begun with the fall of his temperature.

Enteritis.

The complications most frequently met with, and which were most serious and fatal, were enteritis and dysentery. Of these two the former was the more dangerous, and in the rapidity of its fatal issue in some cases absolutely appalling. Specific instances of this trouble will be found below, and everything goes to show that with native races, at any rate, it is the main sequela to be dreaded in Fiji.

Enteritis arises after the chief symptoms of the disease itself have practically ceased, and is, as a rule, brought about by indiscretion in diet. The form which it takes is extremely severe, patients being rapidly reduced to a condition of absolute collapse like that seen in cholera, with profuse watery diarrhœa, acute abdominal pain and tenderness, sunken cheeks, subnormal temperature, thirst, cramps, sighing respiration, clammy sweats, pulses very small and rapid, and soon running. The voice soon becomes a husky whisper, or is even entirely lost; there is no loss of consciousness, but a feeling and appearance of extreme anxiety, which, with the pinched and drawn expression, make up a picture which is sufficiently impressive. All these grave symptoms arose and were at their height in the course of a very few hours, and unless treated with great energy were speedily fatal. They may have begun within twenty-four hours of the fall of temperature to normal, or in some cases may have been delayed as long as six days after this event, when the patient had been regarded as practically convalescent. The dysentery also was of a very acute type, and was responsible for very many deaths; it, too, was in the main brought about by indiscretions in diet.

Mortality amongst Natives.

Folly and Obstinacy of Natives—Whereas no record has come to hand of a single European death from the epidemic, the table appended will show how enormous is the number of deaths among the natives; and this result is in a very large measure due to the obstinacy and folly, not ignorance, of the people; for, as has been noted above, very minute and special instructions were most widely circulated to every village in the group, and there can be no doubt that they were read, for in very many instances the thanks of the people were received for the printed papers, and at the same time it was reported that but for these papers the mortality must have been far higher. In addition, the people were specially visited by all the medical officers and the emergency medical officers, and the provincial inspectors and stipendiary magistrates, and all Europeans who came in contact with them, particularly the missionaries, both Roman Catholic and Wesleyan, both of which bodies did much good by their ministrations. But in spite of this, it is reported in every return sent in how the neglect of people to rigidly adhere to advice caused numberless deaths. An instance from the returns of the Colonial Hospital may be taken as a fair type of what occurred elsewhere. A Fijian who had got over his measles, and was being kept in hospital during convalescence on light diet, became tired of the restraint, and broke out of hospital one night, when, betaking himself to Suva, he partook of a feast of tinned salmon, *taro* and *yaqona*. He then returned to hospital for the night at 10 p.m., was in the collapse stage by 4 a.m. next morning, and was dead at 6 p.m., in spite of the most assiduous care and nursing. If such a condition of things could occur in the hospital, where all watchfulness and care were exercised, it is practically certain that there must have been very many similar fatalities in the out-districts in villages where, from the nature of things, supervision could not be nearly as close.

This is but one instance of many similar cases reported on all sides, and doubtless there were scores of others unreported, which helped to swell the death-rate to its large proportions. Other signs of callousness and carelessness were reported, such, for instance, as the holding of a "feast" in the village on the arrival there of a supply of medical comforts, sharing out to the inhabitants the supply of arrowroot and milk sent for the use of those who were sick, making use of the printed instructions about the disease, and other instructions as to the proper preparation of arrowroot, as corks for bottles.

All these points go to show how very difficult it is to keep the native population alive to the importance of complications of disease and their dangers.

The death-rate among Fijians in outside districts was 4·12 per cent. of the cases, comparing favourably with the rate in the former epidemic in 1875, which was 28 per cent. The death-rate of the epidemic under consideration is made up from returns forwarded by the heads of districts (Bulis), and this shows a total number of cases of measles of 44,014 Fijians in outside districts, with 1,817 deaths, or 4·12 per cent.

The death-rate among Fijians treated in the Colonial Hospital was 2·20 per cent.; but in regard to these allowance should be made for four cases brought from a distance, who were more or less moribund on admission. The exclusion of these four persons from the computation would reduce the hospital death-rate to to 0·98 per cent., approximating more closely to what one might expect. In this last rate, moreover, is included the case of the man quoted above, who absconded from hospital one night and overfed himhimself, and died of enteritis as a result.

How Europeans Fared.

The record of European cases was 450 adults and children in all parts of Fiji, with no deaths; of other Polynesians (New Hebrides, Solomon Islands, Line Islands), 124 cases, with one death, or 0·80 per cent.; of these very few were treated at the Colonial Hospital, with no deaths.

Of Indians in all parts of Fiji 234 cases occurred,

with two deaths, or 0·85 per cent. Indians have, as a rule, had measles before coming to Fiji, hence the small numbers affected.

TABULATED SUMMARY OF TOTAL NUMBER OF CASES OF MEASLES REPORTED, WITH NUMBERS OF DEATHS AND DEATHS PERCENTAGE OF CASES.

POPULATION, 90,006.

PROVINCE	TOTAL CASES			DEATHS			Percentage of deaths to cases
	Males	Females	Total	Males	Females	Total	
Ba and Yasawas	2,483	2,256	4,739	87	86	173	3·65
Bua ..	882	871	1,753	29	28	57	3·25
Cakaudrove ..	1,927	2,026	3,953	54	60	114	2·88
Colo East ..	973	913	1,886	72	54	126	6·68
Colo North ..	909	920	1,829	33	28	61	3·33
Colo West ..	1,160	1,112	2,272	71	70	141	6·20
Kadavu ..	1,649	1,587	3,236	90	80	170	5·25
Lau	1,799	1,726	3,525	68	57	125	3·54
Lomai Viti ..	1,232	1,124	2,356	48	56	104	4·41
Macuata ..	1,073	1,002	2,075	25	28	53	2·55
Nadroga ..	995	936	1,931	57	48	105	5·43
Naitasiri ..	793	772	1,565	34	46	80	5·11
Namosi ..	455	418	873	6	8	14	1·60
Ra	1,786	1,632	3,418	79	84	163	4·76
Rewa	951	1,370	2,321	43	44	87	3·74
Serua	438	456	894	20	20	40	4·47
Tailevu	2,787	2,601	5,388	110	94	204	3·78
Total Fijians in Provinces ..	22,292	21,722	44,014	926	891	1,817	4·12
Fijians in Colonial Hospital	—	—	305	—	7	7	2·20
Fijians in Colonial Hospital and Suva ..	339	32	371	—	8	8	2·15
Europeans in Hospital and Suva	135	143	278	—	—	—	—
Europeans in out-districts	104	68	172	—	—	—	—
Polynesians (all)	89	35	124	—	1	1	·80
Indians (all) ..	163	71	234	1	1	2	·85
Miscellaneous (all)	158	147	305	2	2	4	1·31
Grand Total ..	23,280	22,218	45,498	929	903	1,832	4·02

NATIVE POPULATION OF FIJI ON DECEMBER 31ST, 1902; WITH DEATHS FROM ALL CAUSES, AND DEATHS FROM MEASLES IN EACH PROVINCE.

Province	Population	Deaths from all causes	Deaths from measles
Ba and Yasawas	9,196	565	173
*Bua	4,242	272	57
Cakaudrove	8,009	489	104
Colo East	3,696	271	126
Colo North	2,979	169	61
Colo West	4,630	343	141
Kadavu	6,821	388	170
Lau	6,709	429	125
Lomai Viti	5,817	429	104
*Macuata	4,744	261	53
Nadroga	4,293	304	105
Naitasiri...	2,981	195	80
Namosi	1,359	99	14
Ra	6,978	481	163
Rewa	4,842	244	87
Serua	1,864	164	40
Tailevu	10,846	622	204
Total ...	90,006	5,725	1,942

* Returns of measles cases and deaths from these provinces are incomplete.

The deaths were from broncho-pneumonia in both cases, and the cases were for the most part in children. There is, however, no doubt that many Indian cases in free Indian settlements were not reported.

Of miscellaneous population, chiefly half-castes of all sorts, and Samoans, 305 cases occurred, with four deaths, or 1·31 per cent.

TOTAL CASES OF DEATHS.

A grand total of 45,498 cases of all races, with 1,832 deaths, or 4·02 per cent.; that is, 44,385 Fijians, with 1,825 deaths, or 4·11 per cent., and 1,113 others, with seven deaths, or 0·62 per cent.

It is unfortunate for statistical purposes that returns were not kept of the ages of those affected, for then the death-rates would have been of more value; but it was found impossible to get these returns complete, hence the numbers have to be massed together indiscriminately.

The native Fijian population on December 31st, 1902, was 90,006,[1] of whom nearly 50 per cent. were affected, the remainder being probably those who had suffered from the disease nearly thirty years ago. The number of deaths of Fijians from all causes in 1903 was 5,725, or 6·34 per cent.; of these deaths 1,825 are ascribed to measles and its sequelæ. The epidemic, therefore, raised the native death-rate by 2·23 per cent.

HOW THE EPIDEMIC WAS DEALT WITH.

The steps taken to deal with the epidemic may be summarised briefly. The difficulty in checking it when once started will be apparent when it is remembered that this Colony consists of a group of scattered islands, between which there is constant communication by steamers, boats, and cutters, and the fact that when the epidemic was well started in Suva one, if not more, chiefs recalled all the people of their districts from Suva, thereby materially helping to carry the infection far and wide.

The issue of circulars in Fijian to all parts and of instructions to all Europeans was, in most cases, recognised as a valuable help. All the medical officers, stipendiary magistrates, provincial inspectors, native medical practitioners, missionaries, and other Europeans, were energetic in visiting villages and giving advice, and it is perhaps due to this universal visiting of towns that there was never at any time anything like a panic amongst the natives; and, with the aid of three extra medical officers temporarily employed in different parts of the group, good was probably done.

Large stocks of arrowroot and condensed milk were supplied to medical officers and stipendiary magistrates for distribution as need arose, and a vast quantity of drugs were sent out in concentrated form for distribution for cases in which they were needed. In view of the care that was taken on all sides to help the people by actual medical aid when possible, and by instructions when they could not be personally got at, the large mortality is very disappointing; and it can only be said that, looking to the many instances

[1] Exclusive of 3,378 others who were serving on plantations or mission stations under European control.

of fatal issue due to absolute carelessness that have come under observation, and the (probably) hundreds of others that were not reported, the native Fijians may be considered fortunate to have escaped even as they did.

Two tables are appended to show pecrentages and numbers affected in summary form.

LEUCOCYTE COUNT IN SPLENIC ABSCESS.

By Percy N. Gerrard, M.D.Dubl., D.T.M.H.Cantab.

[Addressed in the form of a letter to the Editors].

I append a partial relative leucocyte count (eosinophiles, large mononuclears, and transitionals excluded), which I made recently in the process of diagnosis of a splenic abscess.

The count having been made simply to ascertain the predominance or otherwise of the polymorphonuclears I simply counted them against the lymphocytes.

The result is interesting as tending to prove that, if the count of 200 is at all "well done," it ought to suffice in the majority of cases to prove or disprove the presence of pus.

First count, 200 only	Polys, 153=76·5 per cent. Lymphs, 47=23·5 per cent.
Second count, 200 only (same slide)	Polys, 152=76·7 per cent. Lymphs, 48=23·5 per cent.
First and second count combined	Polys, 305=76·25 per cent. Lymphs, 95=23·75 per cent.
Third count, 200 only	Polys, 150=75 per cent. Lymphs, 50=25 per cent.
First, second and third count combined — 600 cells	Polys, 455=75·83 per cent. Lymphs, 145=24·18 per cent

May I suggest that in slides where the cells are uniformly numerous, a count of 300 is as useful as one of 500, and the time saved is, of course, 3 : 5.

NO MALARIA IN SEYCHELLES.

By Robert Denman, M.R.C.S.
Chief Medical Officer, Seychelles.

[Addressed in the form of a letter to the Editors.]

I see that in your leading article in the Journal of Tropical Medicine for December 1st, 1905, you say that Fiji and Turk's Island are the only two colonies from which no cases of malaria are reported. This may be literally true, but if it be taken to mean that no other colonies enjoy immunity from malaria it is misleading.

I have been eleven years in the Seychelles, and for nine of the eleven years I have been Chief Medical Officer, and I have never seen or had brought to my notice a case of malaria which originated in these islands. The cases reported are imported ones from Mauritius or East Africa.

Another point of interest, which I put down to our geographical position (roughly a thousand miles from anywhere), is that the Anopheles mosquito does not exist in these islands.

Our immunity from malaria is well known to our neighbours, and we get cases of malaria sent to us for treatment, and they all do remarkably well, probably having one severe relapse soon after they are in, and no other as long as they stay here.

How long this happy state of affairs will last it is impossible to say.

We have cases of malaria, and we have an increasing number of insanitary Indian coolies. Let one of these import a lusty family of Anopheles, and the circle is complete, and we will no longer be able to boast of one of the lowest death-rates in the Tropics.

Gazette des Hopitaux, February 4, 1905.

Tropical Enterocolitis. Sprue. By M. A. Thiroux.

This condition is often a sequela of malaria. There is constipation alternating with diarrhœa and the passage of pseudo-membranes, sometimes of blood. The first part of the motions may be solid, the last soft, as if cream had been poured over them; they contain undigested food, unaltered vegetable matter, muscle fibres, and fat. They are as thin as a finger, from spasm of the bowel or thickening of its wall or true narrowing. Piles are often found.

Post mortem.—The large intestines are hard, thick, cord-like, only admitting a pencil.

Gastric disturbance is usual, with pain in the right side and shoulder, resembling the pain of hepatic congestion and abscess; this is due to distention with gas of ascending and transverse colon. The liver, even if enlarged at first, soon atrophies, and is never fatty; there is a deficiency of bile in the fæces, resulting in intestinal fermentation with formation of toxins, which in turn act on the liver, so that a vicious circle is set up.

Aphthous patches or molar ulcers form in the mouth, especially near the frænum. They may be diagnosed as syphilitic with disastrous result, as these patients are seriously affected by mercury, and in the Tropics syphilis should never be diagnosed from the tongue alone. Neurasthenia and mental trouble are usual, so common that bowel trouble should be excluded before giving bromides.

Treatment.—Enemas are of use as a preliminary of treatment. Constipation should be treated by diet of a mixed nature, red meat, not white, as it contains little nutriment; well-cooked vegetables, avoiding those of a bulky nature, as cabbages. Avoid sauces and pickles, pastry, and above all fat, which in cooking should be replaced by butter. From its containing fat, patients seldom tolerate milk.

Coffee well mixed with chicory is the best drink; wine, beer, and spirits forbidden, as also smoking.

Hydrotherapy is of service, especially the horizontal douche; or the Scotch bath, alternate douching with hot and cold water.

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THE
Journal of Tropical Medicine
MARCH 15, 1905.

MACLEAN-MAXWELL DISEASE.

THE article in the present issue by Dr. James L. Maxwell, of Formosa, confirms the observations published in this Journal "On an Endemic Form of Enlargement of the Os Calcis," by Dr. C. M. MacLean, on November 1st, 1904. Dr. MacLean's experience in the disease was gathered at Kaziankor, on the Gold Coast, West Africa, where he found a number of cases of peculiar enlargement of the os calcis. The disease in West Africa was seen amongst Fantis and Kroos working in the mines. A photograph of the heels of some patients was given in the JOURNAL OF TROPICAL MEDICINE for December 1st, 1904, but it is difficult to convey adequately by photograph so limited a change in size as that due to this condition.

The accounts given by Drs. MacLean and Maxwell, although made from observations so far apart as the Gold Coast of West Africa and Formosa, in the China Seas, seem to point to identical conditions. MacLean describes a preliminary febrile state which Maxwell states he has not met with, a difference in clinical experience due in all probability merely to the time the patients came under observation.

Men working in the mines are more or less constantly under the eye of the medical officer, whereas Dr. Maxwell's cases were from districts at some distance from the hospital.

The seat of enlargement in the os calcis is described by MacLean as affecting the external aspect of the bone. Maxwell gives it as the posterior third of the os calcis, but from the fact that whilst operating he dealt with the outer aspect of the bone it is to be inferred that the chief change in the tissue was in Maxwell's as in MacLean's cases, in the outer aspect.

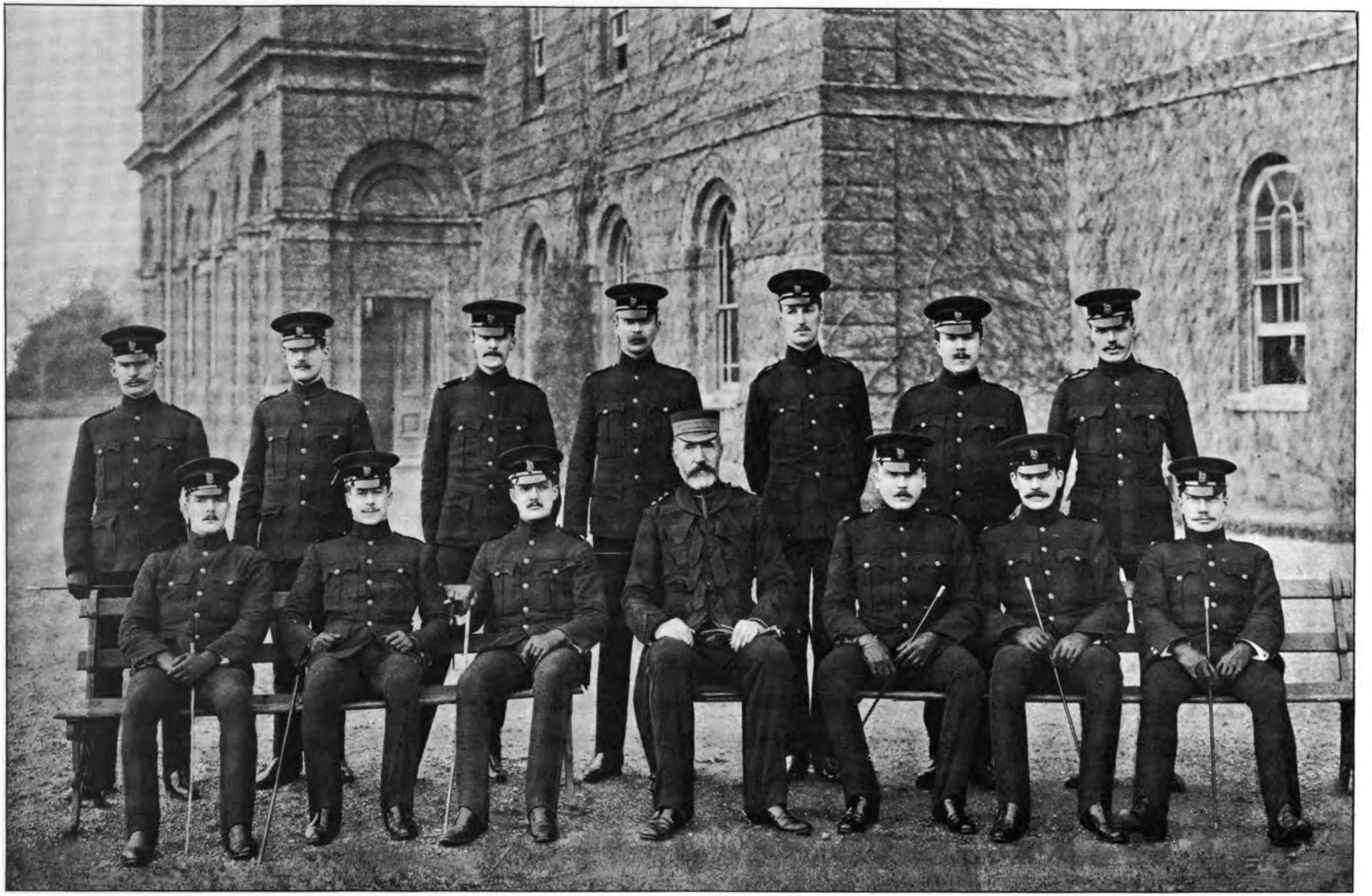
The ages of the patients on the West Coast were, with one exception, young men between 13 and 30; in Formosa the patients were men between 20 and 25.

The one exception mentioned by Dr. MacLean was that of a man between 40 and 50 years of age, and in him the outgrowth had attained much larger proportions than in any of the younger men, indicating probably that, with extended observations, the change in the os calcis may be proved to be that of chronic enlargement and of an outgrowth larger than hitherto recorded.

Dr. Maxwell's operations for the relief of the disease are the first recorded attempts to deal with the ailment surgically. He very properly commenced by raising the periosteum over the thickened patch, and encouraged by the partial success obtained, he, in a subsequent case, with commendable surgical acumen, drilled a hole right through the bone. The latter mode of treatment promises to be the classic treatment for this interesting condition of bone, and Dr. Maxwell is to be congratulated on the initiation.

The pathology of the complaint is still in abeyance; but it would appear to be either inflammatory in origin, or of the nature of an osteoporosis or rarefaction of bone succeeded by some inflammatory change, which gradually becomes chronic and leaves a permanent thickening of the bone.

Lieutenants of the Indian Medical Service who recently completed a Course of Instruction in the Royal Victoria Hospital, Netley, and the Royal Army Medical College, London.



Front Row:— Macrae. Cameron (1st Montefiore prize). Skettle. Col. MACLEOD Stewart. Steel (Martin gold medal). Macgregor.

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LONDON SCHOOL OF TROPICAL MEDICINE. 17th Session. January-April, 1905.

Bale and Danielsson, London.

Mr. Cantlie has named the condition the Mac-Lean-Maxwell Disease, and we think the association of the two names quite justified by the important part each has played in drawing the attention of the profession to what we must consider a new, or, at any rate, a newly recorded ailment,

THE THOMPSON YATES AND JOHNSTON LABORATORIES REPORT.

EDITED BY

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I.—HUMAN TRYPANOSOMIASIS ON THE CONGO.[1]

(*Being the First Progress Report of the Expedition of the Liverpool School of Tropical Medicine to the Congo*, 1903.)

By J. EVERETT DUTTON, M.B.Viet.,

Walter Myers Fellow, University of Liverpool,

J. L. TODD, B.A., M.D., C.M.McGill,

AND

CUTHBERT CHRISTY, M.B.Edin.

CONCLUSIONS.

The examination of trypanosomes seen in stained specimens of blood from cases of trypanosomiasis, from cases of sleeping sickness (typical or doubtful), in the specimens of cerebro-spinal fluid of the latter cases, and in the blood of experimental animals infected with either of three above-mentioned fluids, has led us to the following conclusions:—

(1) The trypanosomes seen in the blood of man, whether symptoms of sleeping sickness were present or not, have always been the same. The number of cases in which trypanosomes from the spinal fluid have been examined is at present too small to permit of a definite description of morphologic characteristics. We have seen forms in the cerebro-spinal fluid similar to those described by Bruce and Castellani, and also longer forms similar to those seen in the finger blood of the same cases.

(2) None of the human trypanosomes seen, whatever their source, have presented any morphologic appearance incompatible with *Trypanosoma gambiense*.

(3) The parasites seen in rats inoculated with the cerebro-spinal fluid of cases admitted to the hospital for sleeping sickness are the same as those seen in rats inoculated with the blood of cases of either sleeping sickness or simple trypanosomiasis.

(4) The organisms seen in the blood of rats inoculated with trypanosomes from any of the three indicated sources have up to the present shown no differences from those observed in animals infected with *Trypanosoma gambiense*.

We have observed the extraordinarily long forms with prolonged flagella, and the stumpy forms with short flagella described as occurring in animals inoculated with the Gambian parasite.

We have, therefore, no reason to suppose that the organisms seen by us in the Congo are other than *Trypanosoma gambiense*.

[1] This Paper was published in the *British Medical Journal*, January 23rd, 1904.

II.—HUMAN TRYPANOSOMIASIS AND ITS RELATION TO CONGO SLEEPING SICKNESS.[1]

(The Second Progress Report.)

By J. Everett Dutton, M.B.Vict.,
Walter Myers Fellow, University of Liverpool,
John L. Todd, B.A., M.D., C.M.McGill,
and
Cuthbert Christy, M.B.Edin.

For descriptive purposes the cases met with are divided into three main groups, although no sharp line of demarcation could be drawn between them: (*a*) Cases with no definite symptoms of illness; (*b*) cases with few symptoms of illness; (*c*) fatal cases showing well-marked symptoms—subdivided into (1) cases showing no sleep symptoms, and (2) cases showing sleeping symptoms. The deep sleep, continued sleep, or lethargy, has been, perhaps, made too much of in the descriptions of the disease, as in the Congo district it played almost a secondary part in the clinical symptoms of the illness.

Death does not seem to be produced by trypanosomes alone. Secondary bacterial infections seem to determine the fatal issue in many cases of Congo sleeping sickness. Out of 22 necropsies, 13 showed complications and obvious secondary infections. They were: purulent meningitis, 4; purulent pleurisy and pneumonia, 1; pneumonia and localised tubercle of lung, 1; localised gangrene of lung, 1; enlarged caseating and breaking down of glands in thorax and abdomen, 2; dysenteric ulceration of large bowel (perforation in one case), 2; universally adherent pericardium (recent), 1; infiltration of pus in femoral, inguinal and intestinal iliac glands (gonorrhœa), 1. In Uganda and the Congo purulent meningitis has been the most frequent complication. In all such cases an almost pure culture of diplococcus occuring in small chains was found.

III.—THE CONGO FLOOR MAGGOT.[2]

A Blood-Sucking Dipterous Larva Found in the Congo Free State.

By J. Everett Dutton, M.B.Vict.,
Walter Myers Fellow, University of Liverpool,
J. L. Todd, B.A., M.D., C.M.McGill,
and
Cuthbert Christy, M.B.Edin.

The first specimens of the maggots seen were met with at Nkanga, in the cataract region of the Congo. The maggots were mostly found by digging with the point of a knife in the dust-like cracks of the mud floor of the native huts. Where people slept on beds or platforms raised from the ground the maggots were not so numerous as under the sleeping mats laid upon the floor. Many of the maggots were turned up from a depth of three inches or more. As many as fifty were obtainable from beneath a floor mat at times. The specimens found varied in size from 2 to 15 mm. in length.

The fly was submitted to Mr. E. E. Austen, of the British Museum, who pronounced it to be the *Auchmeromyia luteola*, Fabr., belonging to the *Muscidæ* family. The fly itself is incapable of sucking blood.

Experiments are being conducted with the floor maggot with the special object of ascertaining whether it is in any way connected with the transmission of trypanosomata.

IV.—THE CEREBRO-SPINAL FLUID IN SLEEPING SICKNESS (TRYPANOSOMIASIS).[3]

104 Lumbar Punctures.

By Cuthbert Christy, M.B., C.M.Edin.

The total number of cases here recorded is too few to permit of any very definite statements, but I think it is sufficient to allow of the following provisional conclusions:—

(1) That in many cases the trypanosomes never find their way into the cerebro-spinal fluid, and in those cases in which they do they are more likely to be found towards the termination of the disease.

(2) That the commencement of the fever or other symptoms is in no way co-related to the entrance of the parasites to the cerebro-spinal fluid.

(3) That a large number of trypanosomes in the cerebro-spinal fluid is rare, but when it does occur there is usually an access of temperature.

(4) That the parasites may come and go in the cerebro-spinal fluid as in the blood.

(5) That enormous numbers may appear in the blood without appearing in the cerebro-spinal fluid, and, to some extent, *vice versa*.

(6) That when trypanosomes are present in the cerebro-spinal fluid its white cell elements are apt to be increased.

(7) That in cases where the parasites gain access to the cerebro-spinal fluid early in the disease, mania and other head symptoms are more likely to be prominent.

A description of the various developmental forms of trypanosomes to be found in sleeping sickness cases in the cerebro-spinal fluid; of the various cells of the fluid, in particular a peculiar large mulberry-shaped cell; of its chemistry; of certain large organisms with actively dancing particles, met with occasionally; of the occurrence of nematode larvæ and ova resembling those of *Ankylostoma duodenale* in connection with the fluid in many cases, and of other matters of interest, must be left for a future publication.

[1] This Paper was published in the *British Medical Journal* of August 20th, 1904, and a Summary was given in the Journal of Tropical Medicine, August 15th, 1904.

[2] Published in the *British Medical Journal*, September 17th, 1904, and summarised in the Journal of Tropical Medicine, August 15th, 1904.

[3] Published in the *British Medical Journal* of August 20th, 1904, and summarised in the Journal of Tropical Medicine, August 15th, 1904.

V.—A COMPARISON OF THE ANIMAL REACTIONS OF THE TRYPANOSOMES OF UGANDA AND CONGO FREE STATE SLEEPING SICKNESS WITH THOSE OF TRYPANOSOMA GAMBIENSE (DUTTON).[1]

A Preliminary Report.

By H. Wolferstan Thomas, M.D., C.M.McGill,
and
Stanley F. Linton, M.B., B.Sc.Vict.

The strains used for experiment were as follows: Three strains of *Trypanosoma gambiense* from the Gambia. Two strains from Uganda: (1) from the cerebro-spinal fluid of a case of sleeping-sickness; and (2) from the blood of a case of trypanosome fever.

The *Trypanosoma gambiense* strain was mostly derived from a boy, and rats, mice, guinea-pigs, rabbits, cats, dogs, monkeys and a goat, donkey, horse and chimpanzee were all successfully inoculated. The strain derived from cerebro-spinal fluid of Uganda cases of sleeping sickness was obtained in a rat which had been inoculated from a monkey infected from the cerebro-spinal fluid of a case of sleeping sickness.

The strain derived from cerebro-spinal fluid of sleeping sickness in the Congo Free State was also sent in a rat inoculated with a cerebro-spinal fluid from a case of sleeping sickness.

Conclusions.

(1) The trypanosomes found in (*a*) cerebro-spinal fluid of Uganda sleeping sickness cases, (*b*) cerebro-spinal fluid of Congo Free State sleeping sickness cases, (*c*) blood of Uganda trypanosome fever cases, and (*d*) blood of Congo Free State trypanosome fever cases, are all identical in animal reactions and morphology with *Trypanosoma gambiense*. The specific name *gambiense* (Dutton) must therefore for the future include the trypanosomes from the above-mentioned sources.

(2) There seems to be no acquired immunity against infection.

(3) There is no transmission of immunity to offspring.

(4) An animal which seems to have recovered may months later show parasites once more, apparently as the result of lowered vitality.

VI.—TWO CASES OF TRYPANOSOMIASIS IN EUROPEANS.

By J. Everett Dutton, M.B.Vict.,
John L. Todd, B.A., M.D., C.M.McGill,
and
Cuthbert Christy, M.B.Edin.

The cases seem well worthy of record, since they tend to indicate with what uniformity the accepted signs of the disease may be expected to occur in Europeans infected with *Trypanosoma gambiense*.

The history of Case 1 is compiled from notes and temperature charts taken by the patient's husband during her illness.

[1] Published in the *Lancet*, May 14th, 1904.

Case 1.—Mrs. G., age 35, a missionary. The patient's first stay in Congo was during the years 1895-99. During this period she had four small fevers, yielding to quinine—maximum temperature 103° F.—and a supposed attack of hæmoglobinuric fever. One year without fever was then spent in England, and in June, 1900, patient, weighing then 147 lbs., again went to the Congo. Soon after her return she had three attacks of fever—maximum temperature, 104° F.—which were successfully treated by quinine; and from November, 1900, to July, 1901, she was in good health.

During the first days of August, 1901, the patient took a long canoe journey from Bolobo to her station at Bongandanga on the Lopori, and was severely bitten by "river flies." At the end of August, six days after the completion of the canoe trip, a severe fever commenced and lasted, without interruption, for twenty-five days. The highest temperature was 104° F., but the fever was very persistent, and remained constant for two or three days at 103° F., then at 102° F., and so on. Quinine and phenacetin had no effect, and the temperature was relieved only temporarily, but unfailingly, by baths. For the next three months, weekly fever. First day, temperature about normal; second day, slight fever; third day, marked temperature; fourth day, "always just one degree higher than third day"—highest temperature recorded, 104·6° F.—fifth and sixth days, temperature much lower; seventh day, "about normal." From January to April, 1902, the temperature ranged between 99° and 100° F., and was never normal.

In January, and again in February, her eyes, particularly the left, were "inflamed," and five days were spent with bandaged eyes in a darkened room. At the end of February, and during March, while on her way from her station to the sea-coast, four more attacks of fever occurred—temperature rising to 102°-103° F. During the voyage to England, where she arrived at the end of April, 1902, the patient's temperature gradually fell to normal. She remained in Europe until August, 1903, and then again returned to Africa. While at home she, on two occasions, suffered from fever, rising to 103° F.; quinine efficacious. During June, 1902, and again in January, 1903, her eyes were once more affected, and oculists were consulted. At various periods during her stay in Europe "red patches" as large as a "half-crown piece," lasting for three or four days, appeared on her legs; they were tender, and the surrounding skin seemed hard. At one time patient's joints seemed stiff, at another she suffered from an "inflamed throat." Three months were spent in Switzerland, the patient gained rapidly in health, and on leaving for Congo, August, 1903, seemed well, and weighed 145 lbs. Her medical history from her last arrival at the Congo to April, 1904, when we first saw her, is as follows:—

"*October* 10th, 1903. Fever on the river steamer; lasted for two days; maximum, 102° F.

"*November* 9th. Still on steamer; temperature suddenly rose to 105° F., reduced by bath; throat bad next day, relieved by gargling; discharge of matter for two days. On Tuesday, November 10th, Wednesday, and Thursday, slight fever. Friday, 13th, 5 a.m.,

105° F., bath ; 10 a.m., 105° F., bath ; 1 p.m., 105° F., bath ; 3 30 p.m., 107° F., bath ; 8 p.m., 105° F., bath ; the temperature fell to about 101° F. after each bath ; patient delirious.

"*November* 14th. Patient too weak to walk, was carried from the steamer ; highest temperature, 102° F. At 2·30 on the morning of the 15th the temperature rose to 105° F., a bath was given, and temperature brought down. On the 16th the temperature was 100° F., and on the 18th normal. There was no more fever until March, 1904."

For two or three weeks she was apparently quite well. About Christmas, 1903, severe headaches commenced ; about the middle of January these began to be accompanied by vomiting. At first the vomiting and headache appeared at irregular intervals, later as follows : "First day, comparatively well ; second day, malaise with slight headache ; third day, bad headache, vomiting two to six times (on one occasion eight times). There was no tenderness or pain, save headache, and no nausea or loathing of food. On the bad days an attempt at any exertion, even to read a letter, was certain to precipitate an attack of vomiting. About February 14th there was vomiting, once or twice, on alternate days. Took liquor arsenicalis, two to six drops three times a day."

March 10th. Stopped arsenic ; left her station for a change.

March 16th. Headache and vomiting.

March 17th. Severe vomiting, bile-stained vomitus.

March 18-20th. Well.

March 22nd. Vomiting and headache, next day emesis more severe ; vomitus bile-stained.

March 24th. Fairly well.

March 25th. Severe headache, vomiting, fever (maximum 104·4° F.). The fever gradually lessened during the two following days, and from March 29th to April 12th patient was "quite well."

Quinine was given during this fever, but was, probably, never retained, since the ingestion of anything, liquid or solid, provoked emesis.

Physical Examination, April 15, 1904. — General condition : Well-made woman ; height, 5 feet 6 inches ; weight, 126 lbs, ; rather anæmic appearance ; complains only of shortness of breath and of becoming easily fatigued.

Skin : No erythemata ; no distinct œdemas, although the skin of legs has a distinctly doughy feel ; on scratching skin capillaries contract.

Lymphatic glands : Slightly enlarged, palpable in axillæ and neck.

Circulatory system : Slight venous pulsation in neck ; slight epigastric pulsation.

Heart : Apex beat normal in position ; cardiac dulness normal ; no thrill over heart or in neck ; sounds, a slight blowing systolic murmur limited to apex area, the aortic and pulmonary second sounds are rather loud ; no venous hum in neck.

Pulse : Frequent (96), tension medium, regular in time and force, artery normal.

Respiratory system : Nothing abnormal subjectively or objectively.

Digestive system : Appetite good ; bowels fairly regular, occasional slight constipation ; tongue clean.

Liver : Dulness normal, no tenderness on pressure.

Spleen : Not enlarged nor tender.

Nervous system : No headache or pain ; sensation to pain acute : sensation to touch, heat, cold, and distance between pin-points perfect ; there were distinct localised hyperæsthetic areas on different parts of the body, under right nipple, at apex of heart and on shins, slightest pressure causes acute pain. Superficial reflexes normal ; knee-jerks just obtainable. Mental condition normal.

Eyes : Pupils react to accommodation and light ; both discs definitely congested (left more than right).

Throat : Tonsils not enlarged, no redness.

Generative System : Menstruation regular, flow normal in amount, generally slight temperature on first day.

Urine : April 29th. Twenty-four hours specimen (preserved with thymo), volume 1,100 ccm. ; acid, colour normal ; cloudy precipitate, Sp. gr. 1020 (82° F.) ; no albumen or sugar ; urea, 1·85 grammes to 100 ccm. urine.

April 30th. Twenty-four hours specimen, volume 1,740 ccm. ; colour, normal ; acid, no albumen of blood ; urea, 1·55 grammes to 100 ccm. urine.

Fæces : Careful examination showed no signs of intestinal parasites.

Liquor arsenicalis, five drops three times a day, was prescribed,and the patient was directed to increase the dose by one drop every third day. This treatment was followed until June 3rd (twenty drops t.i.d.), when symptoms of saturation was evident, and this drug was discontinued for a time and iron and arsenic pills were substituted.

During 1895-96-97, quinine, grains v., was taken daily as a prophylactic against malaria. Its use was discontinued as it was thought to be the cause of "neuralgia." From January, 1903, to the present about three grains have been daily taken.

April 21st. Slight epitaxis ; bleeding at the nose had occurred on three previous occasions, once in Switzerland, twice in Africa, always slight.

May 22nd. For past three days has had swollen wrists, first one, then the other ; to-day one side of face is swollen, no redness or tenderness, or evidence of insect-bite ; these swellings are fugitive, and last only for a day.

June 2nd. For last few days patient has complained of lack of appetite and loss of energy ; the swellings on face and hands persist ; a papular eruption has appeared on the chest.

The accompanying chart shows the type of temperature and the result of the examinations for parasites during the first three weeks of our observations. On April 15th the parasites disappeared from the peripheral blood, and the temperature fell to normal. In spite of daily examinations of cover-slips and periodic centrifugalisation of blood, trypanosomes have not again been seen. The temperature (with one slight exception) has, during this period, always been normal.

Until signs of arsenical saturation commenced to show themselves the patient felt "much better ;" she felt stronger and was less easily fatigued. There has been a slight increase in body weight, and in the value of erythrocyte and hæmoglobin estimations.

May 12th.		May 27th.
Hæmoglobin, 68 per cent.	...	74 per cent.
Red cells, 4,510,000	... ...	4,450,000.
White cells, 4,650	... ..	4,000.

We have never seen malarial parasites in this case.

It was through the kindness of Mr. M., a missionary stationed at Leopoldville, and the husband of the Case "Mrs. M.," described by Broden and Manson, that this case was brought to our notice. He felt convinced that he had, in October, 1903, seen an erythema on Mrs. G.'s forehead in every way similar to those which he had previously seen in each of the cases from the Congo described by Manson.

We have been unfortunate in never seeing this case when erythemata were present.

(*To be continued.*)

THE HABITS OF MOSQUITOES.

(Extracts from "An Account of the Drainage and other Works Carried out with this Object during 1902 and 1903 at St. Lucia, West Indies.")

By Major W. M. Hodder.
Royal Engineers.

Major Gorgas, Medical Corps, U.S. Army, on the Stamping Out of Yellow Fever in Havana.

(*Continued from page* 77.)

Those who wish to make themselves fully acquainted with mosquitoes and their habits must consult technical books; but for the purposes of these notes I give my personal observations on the ways and manners of these insects, looking on them as vermin, so to speak—pestiferous creatures to be destroyed and hunted by every possible means which can be devised.

The first thing a hunter must do when in pursuit of game is to acquaint himself with its habits, and the successful hunter or sportsman will generally turn out to be an individual who has proceeded on these lines.

It is a matter of common knowledge that mosquitoes are found mostly in swamps, or places where water remains in pools for a considerable period; but the swamps, as already pointed out, need not be large morasses or bogs; tiny holes in the bush or grass, or even in rocks, are quite sufficient to give them the necessary amount of water in which to lay their eggs and so preserve the continuity of their kind.

They bear a great resemblance to the numerous midges and water gnats that live near rivers, lakes and ponds in temperate climates; and in all probability their common ancestors lived in marshes. A special study of these insects is being carried out by entomologists; when their work has been more advanced we shall be able to form a better opinion on all these points. But to the ordiuary observer the distinction between the *Culex* and the *Anopheles* is very marked.

It should be noted that all mosquitos are classed as *Culicidæ*, but the common division of *Culex* and *Anopheles* appears sufficient for our purpose.

The former are more or less domesticated, and are found in houses and towns as well as in swamps. They breed in gutters, water-tanks, and filthy pools in back yards with equal facility. Their larvæ can be found in the gutters of high buildings or on the ground level.

So far as my observation goes, such is not the case with the *Anopheles;* they do not deposit their eggs anywhere except close to the ground level; I have examined hundreds of tanks four or five feet above the ground, but in not one single instance have the larvæ been found therein, although the tanks were actually standing on ground where these mosquitoes lived.

But although I can see no proof of their breeding in the artificial receptacles provided by man for water supply, there can be no doubt that they come into houses and stay there for a considerable time, their probable object being to obtain blood from the inhabitants; at any rate, that most certainly is what they proceed to do immediately on arrival.

The actual insects are different in appearance, but can be most easily distinguished when at rest.

The *Culex* perches like an ordinary fly; the *Anopheles*, on the contrary, places his body at right angles to the surface on which he settles.

The larvæ are very different and can be at once distinguished in water. The *Culex* larvæ hang from the surface of the water at an angle, whilst those of the *Anopheles* float flat on the top, the difference being due to the arrangement of their breathing apparatus; one has to look closely to distinguish *Anopheles* larvæ from small chips of dry grass, hay seed, &c.

The *Anopheles* larvæ are shorter than the *Culex*. The latter wriggle rapidly downward when disturbed, whilst the former sinks at an angle with very much less motion.

There is another difference between these two kinds of mosquitoes, viz., the *Anopheles* will as a rule only bite by night, and during the day they lie up; the *Culex*, on the contrary, bite whenever they can get a chance.

Often have I heard Europeans sneer at the coloured people for shutting up their houses as tight as possible by night with the object of keeping fever out. Scientific research has now proved that the natives were correct; if a house has doors and shutters closed the *Anopheles* cannot get in; it has the same effect, though not so perfect, as a house in which all the openings are closed with wire gauze.

After the yellow fever had disappeared our operations were mainly directed to the destruction of the *Anopheles*, and had no yellow fever taken place it is doubtful if the *Culex* would have received so much attention. As stated later, in the area surrounding the barracks both were destroyed indiscriminately as far as possible; but where yellow fever is not likely to prevail, it would be preferable to carry out operations against the *Anopheles* alone in the first instance; though very annoying, the *Culex* cannot, so far as is known, be of much evil consequence.

For many years it has been recognised that those who lived near swamps were especially subject to malarial fevers; and for this reason, although the actual cause was not known, barracks and other houses were constructed as far as possible on hilltops and hillsides, which would naturally be the dryest spots and the furthest removed from the "malarious" ground.

Frequently, however, fevers spread up to high points, and this was specially noticeable at distinct breaks in the weather, *i.e.*, at the end and the beginning of the rains.

Old West Indians say that in a very wet season there is no fever, and the converse; I shall endeavour to point out the reason for this.

In the very dry weather all pools, streams and water-courses dry up; the hills afford no places where the mosquitoes can breed, and they consequently perish (officers of the Royal Army Medical Corps have bred mosquitoes here, which have lived thirty days; perhaps they would have lived longer if free). The only habitations left for the insects are the low-lying swamps; even here they must become more or less congested as the margins are reduced by the drought.

When the rains come all is changed; the small streams are filled, swamps appear on what was in the dry season apparently firm ground, vegetation chokes up the water-courses, and the insects get a chance to spread out from their close quarters. In a country with a contour like St. Lucia, if the rain is practically continuous the insects find great difficulty in breeding on their way up the streams, because the eggs and larvæ are washed clean away even if deposited or hatched out. But when the rains are intermittent the streams and water-courses form a regular chain of pools from the low to the high ground; in these pools the mosquitoes deposit their eggs and the larvæ are rapidly hatched out, soon to become perfect insects. Thus the streams in this state form stepping stones, as it were, from the large low-lying swamps to those on higher ground; and when once the mosquitoes get a footing on the hillsides or tops, they have no difficulty in breeding (if pools or undrained swamps exist) all through the wet season, until the dry weather again establishes a block, when they again die off.

In St. Lucia building ground is very scarce on account of the steepness of the hillsides; consequently the houses of the poorer classes are frequently built close by the streams in the ravines, which are very congested in places and surrounded with trees and bush.

Most of the natives are probably infected, and the mosquitoes *en passant* bear the infection along. The idea that natives do not get fever is common, but a glance at the hospital returns will show the contrary. They are also bitten to a considerable extent by mosquitoes; but the bites do not show up or irritate as much as in the case of Europeans.

A very tiny pool is sufficient for the larva to become the perfect insect. On one occasion the writer found *Culex* larvæ, on the point of their final conversion, in a saucer-shaped depression not six inches across and containing water not more than half an inch deep, which had been formed in some way or other in the top of a large boulder. The hole could only be filled by falling rain, but had been sufficient to keep up a continuous succession of mosquitoes in a house, a few yards off, where everything else was mosquito-proof. When we broke up the boulder the supply of mosquitoes ceased.

There may be another reason why mosquitoes come up to high lands in preference to keeping to their haunts in the extensive low-lying swamps and marshes. They breed with extraordinary frequency, and must therefore multiply at certain seasons to enormous numbers. As with other creatures, only a certain number are capable of remaining in any given area; when this number is exceeded it becomes necessary for the surplus to migrate, and in so doing to invade portions of the country that otherwise they might not visit; after having done this for years, it may become a habit, it may even be an advantage in the struggle for existence, to move about in this manner, although we may not be able to see in what this advantage consists. Thus mosquitoes, like salmon and trout, may possibly run up valleys and streams with regularity at certain seasons.

It has been noticed several times that when barracks have been occupied immediately after construction the troops have at once contracted malarial fevers; the old explanation was that malaria resulted from the disturbance of the soil, and of course there are still people who believe in the "digging theory."

We had great opportunities of observing the effects of digging on a fairly large scale at the Morne during 1902 and part of 1903, when a scheme for the renewal of the whole foul drainage was carried out at a cost of £3,000.

There were no cases of fever amongst the few Europeans who were left on the Morne (the bulk of the white troops were moved to Vigie). Trenches 3 to 8 feet deep were dug not very far from inhabited quarters with no bad results.

But we observed that, even when such trenches were dry, there was a notable increase in the mosquitoes in the neighbouring buildings, although we drained the trenches (an easy matter as a rule on a hillside) and no water lay in them.

This leads me to suppose that mosquitoes are attracted by the smell of freshly excavated earth.

The soil and subsoil consisted in nearly every case of heavy volcanic clays, giving off a heavy smell by no means agreeable, from which, however, the workmen did not appear to suffer in the least.

If, then, a large barracks or fortification is constructed, and no precautions taken as to drainage or oiling standing water, what more likely than that the mosquitoes are attracted, as happened many times during our resewering operations? And having once come on to the site, if they are able to breed and feed on infected workmen, what more likely than that newly arrived troops should develop malarial fevers? This was actually the case when the artillery and infantry moved in December, 1901, to the scarcely completed barrack blocks at Vigie, when the surroundings gave facilities for mosquitoes to breed to almost any extent

Notes and News.

The Royal Waterloo Hospital was, on February 28th, honoured by a visit from H.R.H. the Duchess of Albany.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Indian Medical Gazette," January, 1905.

1. Mosquitoes and Malaria in Ferozepore District, 1903. By J. R. Adie, M.B., Major, I.M.S.
2. A Case of Snake-bite (Cobra?). Recovery. By B. B. Ghosal.
3. Measles in India.
4. Myxœdema in India. Letters. By H. A. Smith, Major, I.M.S., and C. H. S. Hope, M.D.
5. Oil of Eucalyptus in Cholera. Letter by H. C. Banerji.

(1) Major Adie reports the following species of *Anophelina* having been found in the Ferozepore district of the Punjab.

(i.) Nyssorhynchus fuliginosus (Giles). Very common; including a "most quaint" winter variety.
(ii.) Myzomyia culicifaces (Giles). Very common.
(iii.) Nyssorhynchus Stephensi (Liston). Very common.
(iv.) Myzomyia Rossi (Giles). Very common.
(v.) Cellia pulcherrima. Very common.
(vi.) Myzomyia Turkhudi (Liston). Three specimens only.
(vii.) Myzorhynchus sinensis (Wied.). Three specimens only.
(viii.) Nyssorhynchus Jamesi (Theobald). Very scarce, three specimens.
(ix.) Nyssorhynchus maculipalpis. One specimen.
(x.) Myzorhynchus barbirostris (Wulp). Larva only found.

(2) Binode Bihan Ghosal, assistant surgeon, Jangipur, reports a recovery from snake-bite by antivenene. The patient, a woman, was bitten on the toe by a cobra (?) about 10 p.m. Ligatures within ten minutes were applied, one above the ankle, another below and a third above the knee. The "fowl" treatment was applied by the patient's friends at 2 a.m., or four hours after the bite, and kept up for five hours. At 7 a.m. Mr. Ghosal, on seeing the patient, first injected 10 mins. liq. strychnin into the arm, and subsequently 10 cc. Calmette's antivenene into the buttock, followed by a second dose of 10 cc. about half an hour after the first injection. The woman, although apparently in the last extremity, made a speedy recovery.

(3) Measles in the United Provinces (North-West Provinces and Oudh) caused in 1903 no less than 98,112 deaths. These figures show that not only is measles a common ailment in India, but that the mortality from the disease is serious.

(4) Myxœdema would appear to be not an unknown disease amongst the natives of India. Major H. A. Smith reports one case (woman) which occurred in the Dufferin Hospital at Rae Bareli in 1903. Dr. Hope, writing from Pubna, Bengal, mentions four cases, two of the patients being Mahomedans (men), and two Hindus (men). Thyroid gland seems to have been serviceable in promoting cure.

(5) H. C. Banerji, writing from Chunchal, states that he treated cases of cholera in an outbreak of the disease which occurred in May, 1904, as follows: The treatment adopted in all the cases was the administration of oil of eucalyptus with mucilage and syrup; the oil was given in 5-minim doses to the adult. It did not produce any nausea, and the taste, sweetened with syrup of lemon, was not unpalatable. In three cases the sulphate of strychnine was hypodermically injected, and of these two were fatal. The percentage of recovery was 63. The treatment deserves a fair trial, the oil acting both as an antiseptic and stimulant.

MALARIA IN INDIA, 1904. By. Dr. G. Polverini, of Florence.

Polverini states that his object is to compile briefly the results of the latest studies on malaria as carried out in India, more especially by the members of the Commission specially sent there by the Royal Society of London, with the addition of a few considerations resulting from his own personal experience acquired by long residence in India.

He first contrasts the reasons for the occurrence of malaria in the Roman Campagna during the months of July, August and September only, against those which pertain to the various provinces of the great Indian peninsula, the latter being divided into three main groups, according to the severity of their malarial endemicity: (1) Places where malaria is intense, *e.g.*, the Decars in Bengal, certain villages near Jeypore, and to the south of Madras; (2) places where malaria has a medium intensity; and (3) places where the cases are few in number and these not severe, *e.g.*, Calcutta, Madras, and to a certain extent, also, Bombay. In the north of India, owing to the marked difference of temperature at the various seasons, the greater number of cases correspond approximately with the same period as in Italy, whilst in the more central and southern regions malarial cases occur all the year round, but during the dry seasons the regions nearest to collections of stagnant water are those most severely attacked, whilst during the rains—when numerous pools of stagnant water can be formed everywhere—malaria becomes more generally distributed, owing to the greater facilities for breeding places for Anopheles. Other places are only malarious during certain months, and these precisely at the period when numbers of coolies immigrate for agricultural labours; as these coolies possibly come from less malarious districts, they supply the non-immune element in a district where malaria-bearing Anopheles are probably present.

He does not recommend the use of local hospital statistics for ascertaining the malarial endemicity, nor is the spleen test *per se* of much value, but he admits that the endemic index of a district, as indicated by the percentage of infected children, is the most reliable one as to the malarial intensity of a place. The search for and determination of the species of malarial Anopheles which infest a given place is also a fairly safe method for judging its healthiness, but in practice this is too lengthy a one for accurate measurement.

Polverini states that, as far as he knows, the unpigmented forms of parasite have not yet been described as occurring in India; furthermore, that many of the cases which are diagnosed as malarial are not really so, for owing to the spectre of malaria being everywhere present, the physician is sometimes apt to classify as malarial those cases of fever of which the cause is not clear, and the too liberal prescription of quinine (though not as regards doses) only serves to modify the course of the febrile process without arresting it.

As regards *malarial hæmoglobinuria*, the author is of opinion that as yet it cannot be absolutely denied that it is caused by a special form of malarial parasite, as there is now a tendency to admit that there are varieties of the æstivo-autumnal parasites which, whilst almost indistinguishable morphologically, must nevertheless be differentiated by the clinical aspect of the fevers of which they are the cause. If the possibility of this variety of parasite is not admitted, it is difficult to explain the recent abundance of cases of hæmoglobinuric fever in India, when all the other conditions still exist unchanged for so long a time; only by admitting the possibility of this special variety of parasite—which is in some way specific for hæmoglobinuria—having been introduced recently by individuals coming from other regions can a plausible reason be given for this very strange fact. He, however, admits that the individual must have previously suffered from malaria, and also that the blood may somehow become so altered that, under certain special conditions, the specifically altered red blood cells may be dissolved, but only when a fresh factor is added, such as quinine, or a new invasion of malarial parasites, or some other as yet undetermined factor.

With regard to *kala-azar*, whilst most of the cases have suffered at some time or other from malaria, many observers state that kala-azar itself cannot be considered as of malarial origin, as it fails to show the pathognomonic signs of malaria—periodicity of the attacks, parasites in the blood, and amenability to quinine. The presence of Leishman-Donovan bodies in this disease is admitted, but the reader is left to decide definitely for himself whether they are trypanosomes, or belong to the genus *Piroplasma*, or are a new species of parasite.

Lastly, he names some of the malarial Anopheles, and divides the Indian species into four main groups, represented respectively by *A. jeyporensis*, *A. barbirostris*, *A. fuliginosus*, and *A. Rossii*. Dr. Polverini concludes by saying that, whilst some species of Anopheles are highly malarial, rendering the districts where they are found most dangerous for human beings, other species (whilst they could be infected experimentally, so as to show zygote formation) were not naturally transmitters of human malaria, and therefore the districts where they were plentiful could be inhabited with impunity.

J. E. N.

"Revista de Medicina Tropical" (Havana), December, 1904.

Bilharziasis at Puerto Rico.

References to a Study of *Bilharzia hæmatobium* and Bilharziasis at Puerto Rico. By J. Gonzallez Martinez.

Martinez claims to be the first to discover the existence of bilharziasis in Puerto Rico. Out of 1,321 persons examined at random, 59 cases were found to be infected with bilharzia, or 4·46 per cent. The intestinal form only was present, and up to date no single case of the genito-urinary form had been diagnosed. The presence of the ova was generally accompanied by symptoms of pseudo-dysentery, but the ova were also detected in persons who appeared to be in excellent health. Even in patients markedly anæmic from ankylostomiasis their presence in no way interfered with the cure of the anæmia following on the expulsion of the ankylostomes by thymol.

He rejects the theory of Loos as regards the infection of bilharzia through the skin, and believes that all his cases were infected through the stomach.

Furthermore, with regard to the statement that female bilharzia were never found in the splenic vein, he states that in one autopsy which he performed he found both males and females in the splenic vein, specimens of which were forwarded to Dr. Stiles for examination.

J. E. N.

Plague.

PREVALENCE OF THE DISEASE.

India.—During the weeks ending February 4th and 11th the deaths from plague numbered 36,117 and 33,660. In the United Provinces the numbers were highest, standing at 15,367 and 14,438 respectively.

South Africa.—During the weeks ending February 4th, 11th, and 18th no cases of plague in South Africa. Plague hospitals empty on February 18th. No rats or mice in any part of South Africa found infected.

Mauritius.—During the weeks ending February 23rd and March 2nd and 9th the fresh cases numbered 1, 2, and 3; deaths, 1, 2, and 1.

Hong Kong.—During the weeks ending February 25th and March 4th, fresh cases 2 and 2; deaths 2 and 2 respectively.

Singapore.—Between January 5th and 11th 3 cases of plague reported.

Aden.—During the week ending January 28th, fresh cases 152; deaths 127.

Egypt: Suez.—During the week ending February 11th, fresh cases 2.

Brazil.—Between December 26th and January 22nd there occurred at Rio, fresh cases 72; deaths 36.

Argentine.—The local Press announce 2 cases of fatal plague on January 31st.

Chili.—A telegram dated Santiago, February 27th, states that plague exists at Pisagua.

Notices to Correspondents.

1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the JOURNAL OF TROPICAL MEDICINE should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "ANSWERS TO CORRESPONDENTS."

Original Communications.

ELEPHANTIASIS OF THE SCALP.

By G. Allardice Macdonald, M.B., C.M.Edin.

Medical Officer to H.H. The Sultan of Zanzibar and Zanzibar Government.

[See Plate.]

The extreme rarity of this condition is my plea for publishing this case. Elephantiasis of the lower extremities, scrotum, arms, vulva, and mammæ is in all tropical countries very frequently met with, and has been described times without number, but I am not aware of a case affecting the scalp having previously been recorded. The patient, a Swahili, was born and lives in Zanzibar. He is twenty years of age, and first came under my notice in November, 1903. The photographs shown were taken in December, 1904.

The following notes taken in 1903 and 1904 give an accurate account of the case.

When quite a boy the patient noticed a small lump over the occiput. This has increased each year until it has reached the dimensions illustrated by the photographs, and at first sight might easily be mistaken for some extraordinary style of hairdressing. He has from the first onset of the disease suffered, at varying intervals of from one to three months, from febrile attacks, during which the swelling has increased in size and become acutely painful. These attacks are characterised by severe rigor, fever, loss of appetite, and headache, which extend over several days. All the affected parts become much swollen, hot, and intensely painful. These symptoms gradually subside, but the swelling not entirely, and there is after each remission a greater degree of thickening and hypertrophy left.

The appearance of the scalp tumour is typical. The skin is rough, thrown into deep irregular folds and very coarse. The hair is very scanty, and what is left of it also coarse. The skin cannot be caught up between the fingers. The affected tissue cannot be moved over the deeper structures, it is hard, dense, and does not pit on pressure. The thickest part of the mass measures about $2\frac{1}{2}$ inches.

Externally the patient shows no signs of filarial swelling in other parts of his body, such as the legs, arms, or scrotum, but on examination of the glands there is further evidence. The occipital and submaxillary glands are much enlarged, as well as those in both posterior triangles of the neck and both axillæ (especially so on the left side). The glands in the groins are not affected to so marked an extent, but around the saphenous openings (and more so on the left side) they are greatly increased in size. Distinct thickenings and cord-like swellings are felt along the lines of lymphatics on the inner sides of the thighs, and extending down almost to the knees. The popliteal spaces are unaffected. During his febrile attacks the patient states that he has always swelling and pain in one or other of these affected regions.

I am indebted to Dr. A. H. Spurrier for a very careful examination of the blood, in which he demonstrated filariæ in great numbers.

CASE OF RELAPSING FEVER, WITH REMARKS ON ITS OCCURRENCE IN THE TROPICS AND ITS RELATION TO "TICK FEVER."

By F. Creighton Wellman, M.D.

Angola, West Africa.

Eighteen months ago, when I drew up a report on the diseases common in the district,[1] I had not seen relapsing fever here. Since that time, however, I have seen and had opportunity of studying a perfectly typical case which I now bring before the readers of the Journal, it being the first case which, to my knowledge, has been described from this region. The publication of the case has been delayed several months owing to the writer's absence from the district.

Case Record.

No., M. 132; *name*, Gandu; *race*, Bantu (Bihé tribe); *age*, 32; *sex*, male; *date of admission*, March 3rd, 1904.

History.—Patient stated that he had been taken ill with fever the day before admission. He had had no rigor nor vomiting. There were pains in back and limbs. He thought his disease was malarial fever. He had experienced no recent previous illness.

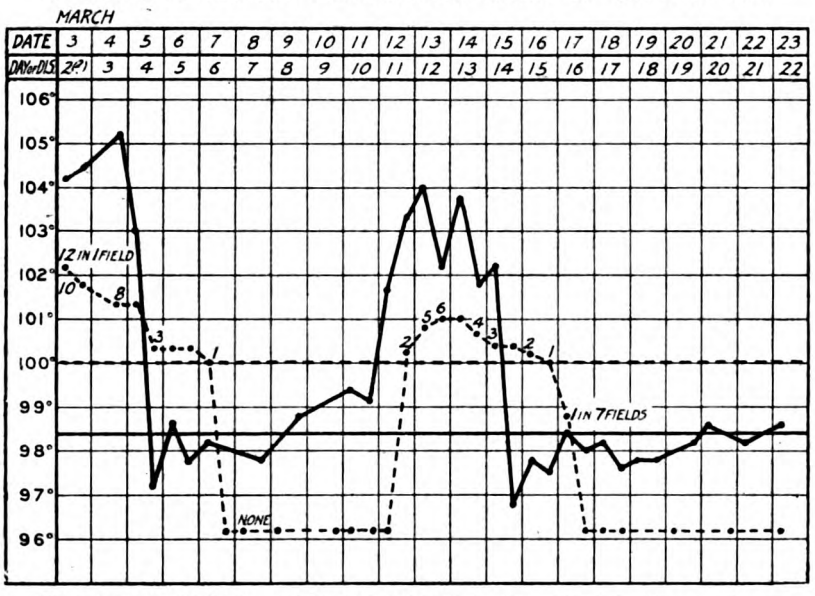
Condition at Time of Admission.—Patient is a large man, fairly well nourished. Says he is thinner now than when taken ill. Temperature, 104·4° F.; pulse, 92; respiration, 29. Pupils normal. Spleen slightly enlarged. *Spirillum Obermeieri* very plentiful in blood, averaging about a dozen to each field ($\frac{1}{12}$ imm. lens, oc. II.). The patient looks very comfortable and I should not have suspected so high a temperature.

Course of the Disease.—The temperature remained fairly stationary for two days after admission and the parasites were found in the blood during this time.[2] On the third evening the temperature was found to have fallen to subnormal, although the parasites still persisted (but in fewer numbers) in the blood until the fifth evening, after which they could not be demonstrated, although several large films were searched. The blood remained clear of parasites for about a week, during which time the patient felt well and wanted to leave the hospital. On being advised to stay he worked March 8th and 9th in making bricks. There was no pyrexia during this time, although the temperature rose to normal and slightly above. On March 11th he had a slight rise of temperature, with some malaise and pains in the back; and the following day his temperature went steadily higher and he took to bed. There was no vomiting or purging. His blood remained free of parasites till the evening of March 12th. On March 13th there were many spirilla, although fewer than in the previous attack. They grew gradually less and finally disappeared from the blood on the evening of March 17th. The temperature (as in the first attack) fell a couple of days before the disappearance of the parasites and remained subnormal a few days after the crisis.

[1] Published in Journal of Tropical Medicine, February 15th, 1904.

[2] I was called away the morning after the patient was admitted and did not get the temperature or examine the blood on that occasion, but with this exception the case was closely watched.

COMBINED BLOOD AND TEMPERATURE CHART OF CASE M. 132.



DESCRIPTION OF CHART.—The temperature is represented in the usual manner by an unbroken line. The dotted line represents the comparative abundance of the parasites in the blood during different stages of the attacks, taking the line marked 100° as representing the average of one parasite in each field. Thus 101° would mean six parasites in each field, 102° eleven parasites, &c. I have not tried to compute the number of parasites in a given volume of blood, as my object was rather a study of the relation between the temperature and the presence of parasites in the blood throughout the attacks.

It will be seen by glancing at the accompanying chart that the second attack was slighter than the first, both in the matter of temperature and of the number of parasites in the blood. The patient was persuaded to remain another week in the hospital after recovery from the second attack. He continued well and worked during the whole period at fairly heavy manual labour. He insisted on leaving the hospital on March 23rd, and I have not seen him since.

The Parasite.—The parasite of relapsing fever measures about 30 μ × 0·1 μ and is sharp at the ends. It was very abundant in this case (*vide* chart) during the exacerbations of fever. The spirillum, or more properly spirochæte, of Obermeier is placed by many observers among the Protozoa.

In view of the theories of Schaudinn,[1] the possibility of the spirochætæ found in relapsing fever representing some stage in the development of a flagellate occurs to one. The relation of the hæmamœba of a certain owl (*Athené noctur*) to a spirochæte, as described by the author just mentioned, is very suggestive in this connection. In the blood one occasionally sees the spirilla lying together in such a fashion as to suggest the multiplication by longitudinal fission, which is characteristic of other spirochætæ and of trypanosomata. Tubes of hæmaglobin agar, inoculated with blood from the patient and incubated at 37° C. showed nothing of such multiplication, and the cultures died out in about ten days. I did not try inoculation experiments with the patient's blood.

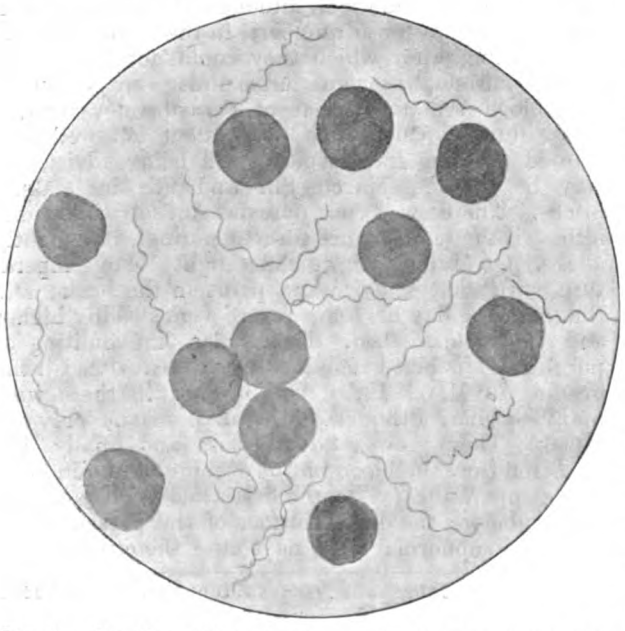


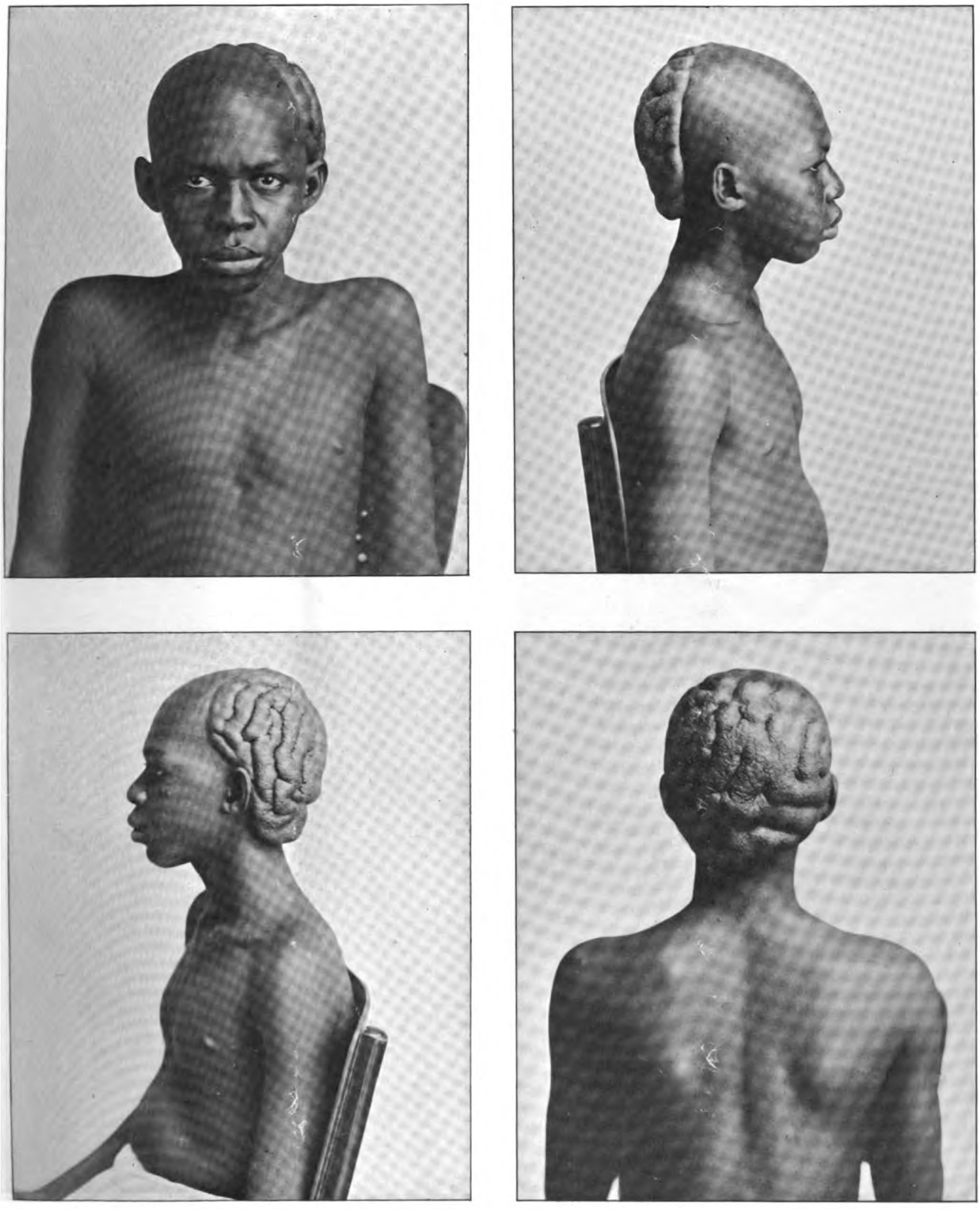
FIG. 1.—*Spirillum Obermeieri* in blood. Stain, carbol-fuchsin. This field represents the infection at its height.

THE OCCURRENCE OF RELAPSING FEVER IN THE TROPICS.

Relapsing fever is not described in the various books on tropical medicine (Davidson, Manson, Scheube, Brault, Fisch, &c.) which I have in my library, but an examination of current medical literature reveals its existence in South China, Sumatra, India, and other parts of the Far East, and in several quarters of Africa. It is quite probable that it has been overlooked in other places, or mistaken for other conditions. For instance, the following description by Dr. A. R. Cook[2] of what he believed to be free microgametes of the *Hæmamœba præcox* in the blood of an African native is almost certainly that of a case of spirillum fever. Dr. Cook writes:—

"The statement in the ninth edition (1900) of Green's 'Pathology,' that 'flagellated organisms are never found until the blood has been withdrawn for about a quarter of an hour' is quite incorrect. The very first case in which I saw it . . . that of an anæmic and emaciated child, *on making a fresh specimen and examining at once, the whole field seemed to be full of a mass of waving and lashing flagella coming*

[1] JOURNAL TROPICAL MEDICINE, June 1st, 1904, *et seq.*
[2] *Idem*, February 15th, 1902, p. 53.



TO ILLUSTRATE ELEPHANTIASIS OF THE SCALP.

By G. ALLARDICE MACDONALD, M.B., C.M.Edin.

Bale, Sons & Danielsson, Ltd.

from nearly every corpuscle. It reminded me of the rippling effect produced by the wind passing over a cornfield![1] The child was desperately ill and died the same night. Careful examination in similar cases has failed to detect any 'crescent' bodies which could have been transformed into the flagellated bodies. On the other hand, the flagella generally seem to spring . . . from unaltered red blood corpuscles."

The above forms a capital description of *Spirillum Obermeieri* in the blood, and there is little doubt but that this was what Dr. Cook saw. His drawings, too, are very suggestive of the parasite just named. Others may have made a similar mistake and, as the parasite is sometimes very scarce in the blood, it may have been overlooked in many cases. Of course, the disease is easily recognised when it assumes the form of an epidemic.

Although relapsing fever also occurs in temperate climates, yet it would seem, in the light of what has been said, to have as good a claim to be ranked as a tropical disease as has malaria, leprosy, plague and other affections, which are only partially dependent on climatic conditions for their survival. The disease under consideration is now generally thought to be carried by vermin. The bed-bug (*Acanthia lectularia*), and more recently the "Ocihopio" tick (genus *Ornithodorus*), of which there appear to be at least two species in Africa,[2] have been suggested as possible hosts. The careless personal habits of savage and semi-civilised peoples greatly facilitate the spread of a disease so transmitted, and its presence in most tropical countries should not therefore be a matter for surprise.

Are "Tick Fever" and Relapsing Fever the same Disease?

Since the publication by Marchaux and Salimbeni of their work on the spirillar disease of fowls, there has been, as I have said, a disposition on the part of some to hypothecate a tick as the carrier of the human spirillum also. Drs. Ross and Milne, of Uganda, have studied "tick fever" with this etiological theory in mind.[3] They found spirilla in the blood of every one of eight cases of "tick fever," although the parasite was exceedingly rare in some instances. Daniels, quoted by Manson,[4] describes the violent symptoms as lasting "for nearly a week. . . . After that fever continues often for three or four weeks." This is certainly suggestive of the clinical course of relapsing fever. However, the acarus above mentioned can be but one of several carriers of the spirillum, since relapsing fever is not confined to the hemisphere producing ticks of this genus.[5]

[1] The italics are mine.

[2] Viz., *Ornithodorus savingnyi*, Aud., and *O. moubata*, first discovered by Welwitsch in Angola, and described under the name *Argus moubata* by Murray in 1877. Neumann has described a third tick from South Africa, *O. Savingnyi*, var. *coca*. This latter is thought by some to be the same as *O. moubata*.

[3] *British Medical Journal*, November 26th, 1904, p. 1453.

[4] "Tropical Diseases," p. 714.

[5] Christy has seen a tick in South America which is very similar to *O. moubata*, *vide British Medical Journal*, September 19th, 1903, p. 653. *Cf.* also Brault, *Maladies des Pays*, Chauds, p. 292.

The "Ocihopio" tick is very common in this district (I have found as many as a hundred in an hour in an old native hut), although relapsing fever is rare. The natives here, when questioned on the subject, say that the bite of the tick gives rise to no disease, except keloids. However, the Bihéan is slow to argue from cause to effect, *e.g.*, he does not connect the larvæ, pupæ and imagines of mosquitoes, &c., and other observers report several tribes who do ascribe "tick fever" to the bites of ticks.

The species of *Ornithodorus* common here is of a yellowish-brown colour when small and greenish-brown when older. The shell which is cast when the tick moults is of a pale yellow colour. The chitinous covering has a rough appearance, due to its being covered with fine points.

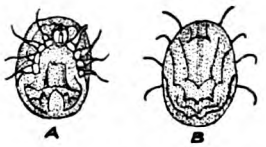


Fig. 2.—The "Ocihopio" tick, *Ornithodorus* sp. A, ventral surface. B, dorsal surface. Large adult, natural size.

The adults measure about 8 or 9 mm. long by 6 or 7 mm. broad, and are deeply furrowed, both on the dorsal and ventral surface. In the younger ones the furrows are much less marked on the ventral surface. The body is thick and rounded at the edges. There are no eyes. The fæces of the tick are white. Compared with other acari, the "Ocihopio" is fairly active. When placed on its back on a smooth surface, which gives no hold for its legs, such as a piece of glass, it has a curious way of changing the shape of its flattened body to a more cylindrical form to enable it to roll over. They hide by day and come out at night to bite. They bite man and all the domestic animals. They are very tough and difficult to kill.

An interesting fact in connection with these ticks is that they are sometimes attacked by a fungus, which destroys them. The disease generally begins at one edge of the tick and appears in the form of a light, almost white, spot which spreads. Later other foci appear in different parts of the body. The infected ticks are more sluggish than healthy ones.

[The tick has been sent to the British Museum for identification; the report will, it is hoped, be given in the next issue of the Journal.—Ed. *J. T. M.*]

NOTE ON THE OCCURRENCE OF FILARIÆ IN FIJIANS; FROM BLOOD EXAMINATIONS.

By the Hon. G. W. A. Lynch, M.B., B.S.Cantab.

During a period extending over thirteen months, the blood of 608 pure Fijian natives was examined at the Colonial Hospital. In every case specimens of the blood were taken both by day and by night, and examined shortly after they were prepared. The natives whose blood was examined were from every part of this group of islands, and really comprised all

the Fijians who were admitted to hospital during the period of observation—adults and children, males and females, but adult males form the majority, because there are always fewer females and children in the hospital admission lists.

In the 608 cases examined, filaria embryos were present in 156 cases, or 25·65 per cent. In 125 specimens of blood taken by day and 136 specimens taken by night, embryos were present, and 105 cases showed them in both day and night specimens; so that thirty-one cases showed filariæ in their night specimens only, and twenty cases in their day specimens only, or 5·09 per cent. and 3·28 per cent. respectively. The embryos examined were similar to those of *Filaria nocturna* in all cases but one; and though in some cases it could be said that where found in both night and day specimens the embryos were in increased numbers in the former, this was by no means always the case; indeed, in some the very opposite condition prevailed, and it was very frequently noted that the number of embryos present was about equal in the blood examined by day or night. The one exception noted was that of a female patient from the province of Lau, in the windward part of the group, whose blood showed undoubted embryos of *Filaria perstans;* this was found on all occasions on which her blood was examined.

These patients were, of course, admitted to hospital for all kinds of disease; but some were admitted for the acute febrile attacks which are of common occurrence in Fijians who are filarial—there were sixteen of these in all. These attacks of "fever" are so common amongst the natives that they are not as a rule in the habit of seeking hospital assistance for this complaint. Fifteen cases were admitted for abscesses of various parts of the body, which had resulted from the lymphatic swellings also common in filarial subjects, and in all these cases the embryos were found in the blood. Four cases of inflamed glands in the axilla or groin were admitted in the period under notice, which were also of filarial origin and showed embryos in the blood. (In this connection it may be noted that of course no account is taken of the large numbers of ordinary abscesses or inflamed glands due to other ascertained causes.)

During the period of observation thirteen cases of advanced elephantoid enlargements, either of scrotum or other parts of the body, were admitted; of these eleven showed no embryos in their blood, but two cases showed them without any doubt whatever.

In all, 119 females were examined, twenty-one cases showed embryos in both night and day specimens, and four cases in night specimens only; 489 males were examined, so that 21 per cent. of women were infected and 26·78 per cent. of men; the difference may be accounted for by the much smaller number of women examined. Only eight cases of children under thirteen or fourteen years old were examined, and these in no case showed any sign of disease.

The following table shows the various provinces of Fiji from which these cases came.

Making due allowance for differences in the numbers from the various provinces, it appears that the prevalence of this disease is about equally great in all parts of the group; it does not seem possible from the table to say that it is found more in the coast provinces than those inland. As a matter of experience, moreover, most of those patients who came from essentially inland provinces live in those parts of such provinces which have a fringe of sea-coast.

Province	No. of Cases Examined	In which Filariæ were found	Percentage	Remarks
Rewa	46	9	19·56	River Delta.
Tailevu	60	19	31·66	Coast and highland.
Ra	20	4	20·00	Coast and highland.
Ba	16	4	25·00	Coast and highland.
Nadroga	20	6	30·00	Coast and highland.
Serua	25	3	12·00	Coast and highland.
Naitasiri	12	1	8·33	Inland.
Colo East, West and North	26	8	30·76	Mainly highland.
Cakaudrove ..	34	8	23·52	Mainly island and coast.
Lomaiviti	107	22	20·56	Island archipelago.
Bua	31	16	51·61	Coast and highland.
Macuata	14	3	21·42	Coast and highland.
Lau	105	24	22·85	Archipelago.
Kadavu	76	27	35·52	Island.
Namosi	5	0	..	Mainly highland.
Unspecified ..	11	2	18·18	—
Total ..	608	156	25·65	—

THE EFFECT OF DRAINAGE AND OTHER MEASURES ON THE MALARIA OF KLANG, FEDERATED MALAY STATES.

(Second Report.)

By Malcolm Watson M.D.Glas., D.P.H.Cantab.

District Surgeon, Klang, Federated Malay States.

On November 16th and December 1st, 1903, in the Journal of Tropical Medicine, I published an account of the anti-malaria works undertaken at Klang and Port Swettenham under the above title, and gave the results obtained up to June, 1903. Since then the work has been steadily carried on with increasingly satisfactory results, and I now propose to bring the account of these up to date.

At Klang the total expenditure to date is $26,000.[1] The area affected by the operations is about 332 acres, 25 acres of virgin jungle (evergreen) and 80 acres of dense secondary growth, in places 30 or 40 feet high, have been cleared, and 22 acres of permanent swamp have been drained. In addition, it was considered advisable to drain 16 acres of permanent swamp lying in a narrow strip along but outside of the original town boundary. The areas cleared are mainly under grass, the vote for up-keep having been raised from $750 to $1,800 per annum. At Port Swettenham the filling-in of the lower-lying areas has necessarily cost much, and the total amount spent has now reached $59,000. It was considered better to spend a large sum in obtaining solid ground useful

[1] $1 British = approximately 2 shillings sterling.

as a town site than to multiply drains to the extent that would have been necessary had less filling in been done, although the latter course would have been much cheaper in the first instance. The whole area, 104 acres, is under grass.

Results.

As before, I will compare the remainder of the district with the two towns in which the experiments in anti-malarial sanitation have been carried out.

I am aware of nothing which could have influenced the following statistics of the past four years, for the conditions both in the district and in the towns have been identical, except for the introduction of a water supply and the drainage works in the two towns. As will be seen, malaria has practically, if not absolutely, disappeared from the two places which in former years were probably the most unhealthy in the whole district, while the remainder of the district remains much as it was.

Malaria Treated at the Klang Hospital.

Since 1901 the number of cases treated has greatly diminished.

Table showing the number of cases of malaria treated at the Klang Hospital, and their percentage to the number treated for all diseases :—

Year	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904
Outdoor ..	172	479	730	554	694	668	737	965	364	245	240
Indoor	91	112	158	128	163	251	467	807	403	219	298
Total ..	263	591	888	682	857	919	1204	1772	767	464	538
Percentage ..	20·4	28·9	25·0	19·7	25·2	20·2	24·9	38·8	20·4	12·1	11·11

The decrease shown is striking, and the following table enables one to appreciate its cause.

Table showing the residence of malaria cases admitted to Klang hospital :—

	1901				1902			1903			1904		
	Klang	Klang and Pt. Swettenham	Pt. Swettenham	Elsewhere	Klang	Pt. Swettenham	Elsewhere	Klang	Pt. Swettenham	Elsewhere	Klang	Pt. Swettenham	Elsewhere
Jan. ..	24	..	3	8	32	18	24	6	5	15	6	1	9
Feb. ..	17	..	0	9	17	10	18	3	0	4	0	0	9
Mar. ..	27	..	3	7	19	2	15	8	2	11	1	0	5
April ..	33	..	4	10	7	6	13	1	1	7	1	0	11
May ..	31	..	0	14	10	8	15	5	3	13	4	0	32
June ..	36	..	5	19	10	1	13	2	2	16	4	1	19
July ..	26	..	9	16	9	3	19	8	1	16	1	1	18
Aug. ..	13	..	15	15	5	4	20	3	0	10	1	0	18
Sept. ..	11	..	13	17	9	9	17	2	1	7	2	1	27
Oct. ..	24	31	34	28	8	3	17	3	1	19	3	0	33
Nov. ..	56	39	79	33	2	3	20	1	2	20	1	0	37
Dec. ..	36	18	23	21	1	3	13	6	3	12	4	0	48
Total..	334	88	188	197	129	70	204	48	21	150	28	4	266

Or to summarise—

Residence	1901	1902	1903	1904
Klang and Pt. Swettenham[1]	610	199	69	32
Elsewhere	197	204	150	266
Total	807	403	219	298

Situated in a malarious country as Klang and Port Swettenham are, their inhabitants are liable to infection should they spend a night away from home in the neighbourhood, and, on the other hand, imported cases of malaria are frequent in both towns. A difficulty arises in connection with the classification of the residence of new arrivals, who giving a history of malaria shortly before coming to Klang or Port Swettenham, develop symptoms again after they have been in the town more than eight days, which is generally regarded as the minimum incubation period of naturally acquired malaria. Such attacks are probably relapses, yet they might be the result of fresh infection acquired after arrival. Consequently, in order not to underestimate the number of cases contracted in Klang and Port Swettenham, and thus to overestimate the benefits derived from the anti-malaria works in the foregoing table, a residence of eight days free from symptoms within the towns brings the case under the heading "Klang and Port Swettenham." In the light of these remarks, it is not uninteresting to note that of the thirty-two cases recorded from the two towns in 1904, eight were probably imported cases having definite histories of malaria before arrival, three[2] were Klang residents, who nine to twelve days before admission had slept out of the town, and eight were rickshaw pullers who frequently sleep away from home after a long journey, instead of returning to town.

The following table is evidence of a considerable saving of life.

Table showing the residence of fatal malaria cases admitted to Klang Hospital :—

Residence.	1901	1902	1903	1904
Klang and Pt. Swettenham ..	52	9	5	0
Elsewhere	19	23	14	27
Total	71	32	19	27

[1] In 1901 a certain number lived in Klang and worked at Port Swettenham, *e.g.*, loading coolies. Others stayed some nights in Klang and some in Port Swettenham. Such cases are entered under the heading "Klang and Port Swettenham."

[2] One was my boy. On October 28th, 1904, I found the man in charge of the Resthouse at Jugra had malignant malaria, a severe crescent infection. Despite a warning my boy slept in the man's room. From November 6th to the 9th the boy had headache, on the 10th and 11th his temperatures were 103·8 and 104° F. respectively, and on the 12th malignant parasites were found in his blood.

Mortality of the District of Klang.

As the population of the district increased 198·87 between 1891 and 1901, and is still rapidly increasing, the mortality bills naturally increased, but since 1901 there has been a diminution.

Table showing the number of deaths registered in the district of Klang :—

Year ..	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904
Deaths ..	206	342	511	466	475	538	780	998	547	543	612

When the register is further analysed the decreased mortality is found to have taken place in the two towns.

Tables showing the causes and places of deaths registered in the district, corrected for deaths occurring in hospital.

I.—Deaths in Klang and Port Swettenham (Population about 4,000 in 1901 and Increasing).

Year	1900	1901	1902	1903	1904
Fever	259	368	59	46	48
Other Diseases	215	214	85	69	74
Total	474	582	144	115	122

II.—Deaths Elsewhere in the District (Population about 14,000 in 1901 and Increasing).

Year.	1900	1901	1902	1903	1904
Fever	173	266	227	230	286
Other Diseases	133	150	176	198	204
Total	306	416	403	428	490

The above tables bring out in a convincing fashion that subsequent to the anti-malaria works there has been a great reduction in the number of deaths recorded in Klang and Port Swettenham, while in the district outside of the towns the number of deaths still increases ; and it is evident, too, from the first table that the improvement is due mainly to the great reduction in the prevalence of malaria. Striking as this appears from the tables, the actual reduction has been, I believe, still greater, for among the deaths recorded as due to "other diseases" many were doubtless due to malaria, for in a malarious country the native informant is prone to report deaths really due to malaria as due to diarrhœa, dysentery, convulsions in children, or other terminal complications of malaria. Indeed, natives so frequently fail to recognise that their illnesses are connected with malaria that it has been found necessary to examine microscopically for malaria parasites the blood of all cases of diarrhœa, dysentery, anæmia, cardiac and renal diseases admitted to Klang Hospital, quite irrespective of whether the patient says he has had fever or not. That the native informant of death should make a mistake can, therefore, easily be understood. At the same time, the removal of malaria to such extent as has occurred has undoubtedly improved the general health of its inhabitants, and those who in former years would have succumbed to "other diseases," simply because they were in a low state of health consequent on malaria, are now able to resist the attacks of such "other diseases," or if attacked to overcome them and recover.

Although a good water supply was brought into the towns in December, 1902, and greater attention is being paid to general sanitation, I cannot help feeling that the improvement has been due mainly to the diminution of malaria. As all deaths, with the exception of those certified by myself (the only qualified practitioner within twenty miles of Klang), are registered in accordance with the report of the friends, I regard the above tables as an "unsolicited testimonial" unconsciously given by the native community to the efficacy of the anti-malaria works in Klang and Port Swettenham.

Children Infected with Malaria.

Unfortunately, during 1901, no examination of children was made to ascertain the percentage infected, but that they suffered severely I had abundant evidence, both in my official and private practice. The disease frequently ran through a household, as an example of which I may mention that on one occasion (April 15th, 1901) when called to the Astania, I found no less than 15 children suffering from malaria. In 1901 there were in Government quarters at Port Swettenham 13 children under the age of ten; of these, 9 contracted malaria within three and a half months of their arrival.

Table showing the percentage of children infected with malaria in various places in the district of Klang, November and December, 1904 :—

Place	Nation	Age 2 years and under		Age over 2 and under 5		Age 5 years and under 10		Total		
		Examined	Infected	Examined	Infected	Examined	Infected	Examined	Infected	Percentage Infected
Klang ..	Mixed ..	64	0	71	0	38	1	173	1	0·57
Port Swettenham	Mixed ..	27	0	29	0	31	1	87	1	1·14
Batu Tiga	Mixed ..	7	0	9	0	10	3	26	3	11·1
,,	Tamils ..	4	4	5	2	7	4	16	0	62·5
,,	Mixed ..	1	1	2	2	0	0	3	3	100·0
Damansara	Tamils ..	15	8	5	3	21	5	41	16	37·8
,,	Tamils ..	3	3	2	2	7	7	12	12	100·0
Kapar ..	Tamils ..	11	2	4	3	40	2	25	7	28·0
,, ..	Malays ..	2	0	6	1	4	0	12	1	8·3
,, ..	Tamils ..	3	0	4	0	2	0	9	0	0·0
,, ..	Tamils ..	5	2	3	1	2	0	10	3	30·0
Bukit Rajah	Malays ..	16	3	23	3	20	5	59	11	18·0
,,	Tamils ..	11	6	10	2	21	10	42	18	41·4
,,	Banjarese	4	3	10	7	10	5	24	15	62·5
T. Gadong	Mixed ..	5	0	7	0	7	2	19	2	10·5
		87	32	90	26	121	43	298	101	
		= 36.78%		= 28·88%		= 35·53%		= 33·89%		

In 1904, selecting November as the most unhealthy month of the year, I personally examined the blood of a number of children under ten years of age, taken without selection, except as to place. Every child at Port Swettenham, including those in the native houses as far as the fourth mile on the Klang road was examined. At Klang the children were from all parts of the town. As a "control" thirteen groups of children in and around the outlying villages of Batu Tiga, Damansara, Bukit Rajah, Telok Gadong and Kapar were examined.

Many of the children on estates were actually under treatment with quinine, which necessarily lowered the percentage of cases in which parasites were found.

The thirty-two children in Government quarters at Port Swettenham have been twice examined. On the second occasion all were free from infection.

As if to emphasise the freedom from infection of the proper residents of Klang and Port Swettenham, the two cases found there during the examinations were clearly imported cases. The one with benign tertian parasites came from the distant village of Cheras, where she had had fever off and on for four months. Two days after her arrival with her father, a police sergeant, she had a relapse. She was seen by me ten days after her arrival. The other, with crescents, belonged to a travelling company of native players. He had been fifteen days in Klang on the date of examination, but gave a definite history of fever shortly before arrival, and said he had had no fever while in Klang.

According to this test, Klang and Port Swettenham appear to be absolutely free from malaria, except such as is imported, and stand out in striking contrast to the rest of the district.

Improved Health of Government Officers.

The following table shows how much Government and its officers have benefited.

Table showing the number of certificates and of days of sick leave granted to Government officers resident in Klang and Port Swettenham on account of malaria :—

	1901.	1902.	1903.	1904.
Certificates ...	236	40	23	14
Days of leave...	1,026	198	73	71

No less than forty of the seventy-one days in 1904 were granted to two officers who contracted the disease in Jugra. Excepting these, no officer resident in Klang or Port Swettenham has suffered from malaria since July 12th, 1904.

The following figures apply to Port Swettenham and show how rapidly the new population was stricken when the port was opened in September, 1901. From the daily house-to-house visits made by the Deputy Health Officer, I had an unusually good opportunity of noting the progress of the epidemic among those living in official quarters.

Table showing the number of persons living in Government quarters prior to October 31st, 1901, attacked by malaria within certain periods after arrival :—

Days after arrival ..	9-18	19-28	29-38	39-48	49-58	59-68	69-78	79-88
No. of persons attacked	13	12	20	20	16	20	8	1

The general dosing with quinine and free petrolage in the third month after the opening of the port doubtless assisted in the rapid diminution of the epidemic.

It can be readily understood that when the official population was being attacked at the above rate the work of the port was considerably interfered with. It is also evidence of the extreme unhealthiness of the place. The next table shows a marked improvement.

Table showing the number of attacks (including relapses) among persons living in Government quarters at Port Swettenham 1901 only, from September 15th to December 31st) :—

Year	1901	1902	1903	1904
No. of attacks	188	98	35	6

In all the five cases in 1904 (one policeman had two relapses) there was a clear history of malaria before arrival, and there is little doubt these were all imported cases.

The following and final figures I cannot help regarding with less satisfaction, nor can I quite decide whether they should be adduced as proof of the success of the measures against malaria or reckoned in their cost. In 1901 the book value of my private practice from attendance on malaria patients resident in Klang and Port Swettenham was $734. In 1904 I had not a single patient with malaria resident in the two towns.

Remarks.

It is unnecessary, I think, to multiply figures. In whatever direction one turns it is plain that the two areas which were so malarious in 1901 are now practically, if not absolutely, free from the disease, and that the district surrounding these two areas remains much as it was. Nor is the improvement matter for wonder, for I think it no exaggeration to say that 99 per cent. of the breeding places of Anopheles of all species have been abolished and the ground water has within the two towns been lowered considerably, everywhere below the surface of the soil, and it is no new discovery that drainage abolishes malaria.

Mosquitoes.

Although I have said nothing of the mosquitoes of Klang and Port Swettenham, the scientific side of the problem has not been neglected. Dr. G. F. Leicester, of the Institute for Medical Research, Kuala Lumpur, of which Dr. Daniels is now Director, has been engaged for over two years on an exhaustive study of the mosquitoes of Selangor. At Klang he identified six and at Port Swettenham seven species of Anophelines, viz., *M. Rossii*, *M. barbirostris*, *M. albotæniatus*, *M. congregata*, *N. nioipes*, *N. maculatus* and *C. Koetin*, while in the surrounding district *Anopheles Treacherii* and a new Psorophora are to be found. Until, however, his observations on their powers of carrying malaria under natural conditions are completed, it will be impossible to apportion the blame among the various species. Fortunately at

Klang and Port Swettenham the same system of drains abolished the breeding places of both the dirty and clean breeders, and indeed of the breeding places of all mosquitoes which breed in natural collections of water in the ground.

Organisation and Methods.—In Klang no hot or cold season even temporarily stops the mosquito pest. This moist, equable climate, with its rainfall of about 100 inches per annum spread over all the months of the year, and the swamps, wells and ditches breeding the various species of Anophelines in abundance without intermission, appeared at first sight to make the task of eradicating malaria well-nigh hopeless. In selecting the method of campaign certain circumstances had to be taken into consideration. The active co-operation of the native community could not be expected. But the Sanitary Board had power to compel the owner to drain or fill in swampy land, or obnoxious collections of water, and to clear away undesirable vegetation in private property. This power was used largely in 1901. The acreage of swamp, the heavy rainfall, and the amount of supervision required, apart altogether from its cost and temporary efficacy, prohibited the use of petroleum. Again, with an area so extensive, subsoil water so high, and aquatic vegetation so dense, the idea of sweeping out or repeatedly dealing with individual collections of water, could not be entertained. The ordinary duties of the District Surgeon, who is in charge of the districts of Kuala Langat and Kuala Selangor, in addition to Klang, limited the amount of supervision he could have given to these methods. Clearly, then, only by lowering the ground water through draining and filling in, would the swamps be abolished and the formation of pools of rain-water be prevented. And this had the great advantage of being permanent and costing little to up-keep, an important point, as sanitation is so largely a financial question. Thus it came out that after the breeding places had been defined, the engineers of the Public Works Department designed and carried out the drainage schemes which abolished them, and to the engineers is due the credit of so successful an issue. Except for the expenditure on petroleum and quinine for about two months at Port Swettenham, in 1901, the whole of the money has been spent on permanent work, which, being carried out by the ordinary district staff, has cost nothing for supervision. The burden has really fallen on the engineer, and the medical officer has been able to carry on his departmental duties without interruption.

Expenditure.—Lest the comparatively large sums spent at Klang and Port Swettenham should deter less wealthy communities from embarking on anti-malaria works, I venture to express a few opinions on this subject. I believe that in both towns an equally satisfactory result as regards malaria could have been obtained at much less expenditure, but local circumstances led to the adoption of the more expensive methods in order to give greater permanence to the works. At Port Swettenham, which was a low-lying mangrove swamp, a muliplication of the main and subsidiary drains would have given the same results as regards malaria, but a large number of open drains would have had many disadvantages in a town, as compared with an estate, and subsoil drainage is rarely employed here. It was decided therefore that "filling in" and "levelling up," although more expensive, would make the land more suitable for a town site than simply cutting numerous drains through uneven ground. Again, at Klang, as the available fall for the drains was very small, being limited by certain railway culverts with which it was undesirable to interfere, and as certain of the drains were also town sewers, I wished to have as much of the system as possible with a concrete invert. Yet I believe that had all the railway culverts been lowered, as some have been, earth drains would have sufficed to stamp out malaria, and would have cost much less.

Immigration of Mosquitoes.—A definite improvement in the health of Klang was evident when only the swamps nearest to the main groups of houses had been dealt with, and while other swamps within the town were still untouched. The mosquitoes from these did not appear to travel any distance, and there has been no evidence of dangerous immigration of Anophelines from the extensive breeding places which until the middle of 1904 existed just outside the town boundary, and some of which still remain. Yet the species breeding in these swamps were identical with those breeding within the town. In other words, breeding places are being *permanently* abolished, progress in the work is associated with progressive improvement in health, which is exactly what might have been anticipated. I do not, however, see any way to measure the percentage of mosquito reduction necessary to give a certain reduction in malaria. Finally, to the Sanitary Board of Klang praise is due for pursuing a definite policy of drainage. And in the frank manner in which the Government has accepted and applied the results of scientific research, it has set an example worthy of imitation by others. Not in the drainage of Klang and Port Swettenham alone has the Government of Selangor undertaken the campaign against malaria. The hospitals of Klang, Kuala Selangor and Kuala Langat have each a mosquito-proof ward, and in all the hospitals in the State a mosquito curtain is provided for each malaria patient. Any Government officer can have a mosquito-proof room fitted up in his house simply for the asking; all police are provided with mosquito curtains as part of their equipment; quinine can be obtained at cost price from Government all over the State; and Government has provided large sums to bind, drain, reclaim, and fill in swamps in various towns in the State, and the work is rapidly progressing. All this is exclusive of the large sums annually provided for ordinary sanitary works. I think, therefore, I may fairly claim for the Government of Selangor the honour of being the first British Administration to follow Ross in an attempt to confer on those entrusted to its care the benefits of his great discovery.

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THE

Journal of Tropical Medicine

APRIL 1, 1905.

As having a bearing on the *Schistosomum Cattoi* (Blanchard), a new blood-fluke of man, described by Dr. Catto in a recent number of the Journal, an article by Prof. Katsurada, a translation of which appears in our current number, on a parasite—*S. Japonicum*—found by him in cats in certain provinces of Japan and apparently identical with that found and described by Dr. Catto, may be of interest.

So far back as 1890-93, Yamagiwa and Kurimoto had observed the presence of eggs of an unknown parasite in various organs and tissues of persons from the province of Yamanashi, where a curious endemic disease is known to exist.

In April last year, Prof. Katsurada found ova not unlike those of *S. hæmatobium* in the fæces of persons suffering from this disease. Continuing his investigations he found in the portal vessels of two cats from the province of Yamanashi a new species of trematode to which he gave the name of *S. Japonicum.* On comparing the ova with their contained embryos from the fæces of the living and in the liver and intestinal wall of patients who had died from this disease with those found in the tissues of the cats, he found they were practically identical. Nowhere is it stated in Katsurada's paper that he found adult trematodes in man—only in cats did he succeed in finding them, their occurrence in the former being inferred from the similarity of the ova and their contained embryos, and the pathological lesions found in man with those in cats infected by *S. Japonicum.*

The first actual discovery of a *S. Japonicum* in man was made by Dr. Fujinami; this he found in May, 1904, whilst Katsurada was still engaged in his investigations.

In Dr. Catto's case, on the other hand, the ova in the tissues and sections of the parental forms shown at the meeting of the British Medical Association, in July last, were from the same cadaver.

The description of the worms, male and female, the characters of the ova, their distribution in the various organs, and the lesions they occasion tally very closely with those given by Dr. Catto.

There are, however, just one or two minor points of difference, viz., the remarkable difference in the breadth of the female ·44 as against ·113, the absence of any miracidium in any of the ova in Dr. Catto's case, and the possible difference in the habitat of the parent worms.

Until these points are settled, and until there is positive proof of the identity of the parasites *S. Japonicum* and *S. Cattoi,* described respectively by Prof. Katsurada and Dr. Catto, it might be well to suspend judgment before admitting priority of discovery to the former.

D. T. S. K.

"Lyon Médical," June, 1904.

Actinomycosis de l'Amygdale, Phlegmon Cervical Consecutif (Actinomycosis of the Tonsil).

Poncet, a male, aged 44, had suppuration in the right tonsil, later small superficial abscess at the angle of the jaw. The teeth were in good order. Incision and iodine internally resulted in cure. Three cases are quoted where the tonsil was first affected.

Correspondence.

TUBERCULOSIS AMONGST CIVILISED AFRICANS.

TO THE EDITOR OF THE "JOURNAL OF TROPICAL MEDICINE."

SIR,—In an article in the Journal of January 16th, 1905, Major F. Smith, D.S.O., writing upon tuberculosis amongst civilised Africans, says that he makes no attempt to account for the predilection of tubercle for the civilised African.

In 1900-1901 I was attached to the Station Hospital, St. Helena, and the men of the West India Regiment were admitted to the wards along with European troops.

The number of cases of tubercle amongst the admissions was very striking, and one was naturally led to enquire as to a possible cause for it.

I formed the opinion then that one habit at least to which the West Indians were addicted went a long way to explain why tubercle was prevalent.

On going the round of the Hospital in the evening after bedtime, one invariably found that the West Indian soldier slept with the head and face completely enveloped in the bedclothes.

The windows of the ward were always carefully shut by these men, in spite of orders to the contrary, as soon as they thought it would not be observed. An open window or any amount of cubic space would, however, be of small benefit to a man whose head is buried under a blanket and quilt.

I made it a point to visit their barracks after "lights out," and found that, with very few exceptions, the same habit prevailed there.

These black troops are composed of young men at the most susceptible age for infection, and a habit such as I have described persisted in for a number of years is quite sufficient in the light of present knowledge to account for the predilection of tubercle for the civilised West African. The wonder is that the percentage of infection is not greater.

A course of simple instruction on the causes, &c., of tuberculosis might do good.

To eradicate, however, this pernicious practice of sleeping in the fashion described, strict supervision and the punishment of offenders will be necessary.

I have no doubt that were this habit stamped out, a large reduction in the admissions for tubercle would result.

W. J. ARNOLD,
Colonial Surgeon.

St. Helena,
March 10th, 1905.

THE THOMPSON YATES AND JOHNSTON LABORATORIES REPORT.

(*Continued from page* 93.)

VII.—SUPPLEMENTARY NOTES ON THE TSETSE-FLIES.[1]

(GENUS GLOSSINA, WEIDEMANN.)

By ERNEST E. AUSTEN.

THE following are the known species of tsetse-flies. They are: (1) *Glossina tachinoides* (Westwood). (2) *G. palpalis* (Robineau-Desvoidy). (3) *G. pallicera* (Bigot). (4) *G pallidipes* (Austen). (5) *G. longipalpis* (Wied.). (6) *G. morsitans* (Westwood). (7) *G. longipennis* (Corti), and *G. fusca* (Walk.).

Since the monograph appeared, Dr. Emile Brumpt described another species under the name of *G. Decorsei*, from specimens obtained by Dr. Decorse in the River Shari and on the shores of Lake Chad.

The new species, however, has proved to be none other than *G. Tachinoides* (Westwood), already described in 1850.

[1] Published in the *British Medical Journal*, September 17th, 1904, and summarised in the JOURNAL OF TROPICAL MEDICINE, August 15th, 1904.

VIII.—A NEW HÆMOGREGARINE IN AN AFRICAN TOAD.

By J. W. W. STEPHENS, M.D.Cantab., D.P.H.,

Walter Myers Lecturer in Tropical Medicine, University of Liverpool.

ABSTRACT.

Out of a batch of toads received from Sierra Leone, in October, 1903, five were examined by me. Four out of the five were infected with hæmogregarines. In one toad they were with difficulty found, in the others the hæmogregarines were fairly plentiful. At a first examination it struck me that the forms present differed from any of those described as occurring in reptiles or amphibians.

It may be well first to describe the classification used by Minchin.

ORDER HÆMOSPORIDIA (Danilewsky).

Sub-Order I. HÆMOSPOREA.

Genus I. *Lankesterella* (Labbé, 1899) for *Drepanidium* (Lankester). The hæmogregarine is not more than three-quarters the length of the blood corpuscle it inhabits.

Type.—*K. ranarum*, or more correctly *L. minima* (Chaussat).

Genus II. *Karyolysus* (Labbé, 1894). The hæmogregarine does not exceed the corpuscle in length.

Type.—*K. lacertarum* (Danil), from lizards.

Genus III. *Hæmogregarina* (Danilewsky, 1897) (syn. *Danilewsky*, Labbé, 1895). The body of the parasite when adult exceeds the corpuscle in length, and is bent on itself within it, in a characteristic manner like the letter U.

H. lacazei in lizards is the commonest.

H. magna is the only hæmogregarine in the strict sense so far described in amphibians, and it is possible that this is the macrogamete of *Lankesterella, sp.*

The parasite, as seen in stained specimens, presented itself under two forms.

(1) The first form consists of a parasite only slightly longer than the red cell, its pointed end being bent into a slight crook. In this form there is not observed the great enlargement and decolouration of the red cell seen in the case of the second form. With Romanowsky the nucleus stains typically, reddish-rose colour, and the protoplasm shows a number of coarse reddish granules mainly collected at the pointed end. In its staining the nucleus differs from that of the other form, which very rarely is stained red but only blue. The nucleus of the cell is displaced, but not nearly to the same extent as in the second form. Younger forms than this I have not observed.

(2) The second form consists of a typically folded vermicule. They vary somewhat in size, and in the

larger forms several peculiarities of structures are noticeable.

The parasite itself has a well-developed nucleus situated in the thicker half of the parasite in the stained specimen. The nucleus commonly has a rhomboidal or elongated triangular shape. It stains blue with Romanowsky and very rarely red. Not uncommonly at the tip of the "tail" end of the parasite there is a blue-stained spot. The large U-shaped forms are surrounded by a well-defined cyst which separates the parasite from the cyst wall. This cyst frequently shows some peculiarities of structure; at the end corresponding to the bend of the hæmorgregarine there is an area staining a deep dull red. This area is concave on the side facing the parasite, so that it appears to fit over the parasite as a cap. It is not, however, actually attached to the parasite, for sometimes a clear line can be seen separating this reddish area from the parasite. The larger forms of the U-shaped parasite invariably show this stained (capsular) area, but it is not developed in the smaller forms, when also the cyst is not clearly defined. A certain amount of staining reaction (red) also is seen in other portions of the cyst. It is, however, in these encysted forms of the parasite, when found entirely free from red cells, that the cyst contents surrounding the parasite show a more diffuse staining. In these the conical area at one end is often lost and instead the cyst shows a general mottling with rather coarse granules.

IX.—TWO CASES OF INTESTINAL MYIASIS.

By J. W. W. Stephens, M.D.Cantab., D.P.H.

The larvæ described in this paper were procured from two young children in Liverpool, in October, 1903. In both cases the larvæ were stated to have been passed *per rectum*.

In the first case the larvæ of two different species were present, viz., those of *Musca corvina* and *Homalomyia canicularis*. In the latter case the larvæ of *Homalomyia canicularis* only.

The larvæ of *Musca corvina* are characterised by:—

(1) The single hook.

(2) The polygonal areas (seen anteriorly).

(3) The lateral respiratory appendages with their eight processes.

(4) The posterior respiratory syphons (two) with their convoluted tracings.

The main characteristics of the larva of *Homalomyia canicularis* are:—

(1) The pitted surface.

(2) The spinous dorsal ventral hairs and the accessory hairs.

(3) The lateral processes of eight segments on the anterior segment.

(4) The posterior stalked syphons.

(5) The anal markings.

X.—NOTE ON THE PATHOLOGY OF TROPICAL "SWELLINGS."

By J. W. W. Stephens, M.D.Cantab., D.P.H.

The patient was sent by Dr. Fletcher, Degama, Southern Nigeria. In his letter dated June, 1903, Dr. Fletcher says: "He has for some months been suffering from cellulitis, or at least peculiar swellings in his hands, arms, feet, and face, *i.e.*, either one or the other; sometimes only one of these is affected at the same time, sometimes two. I know Calabar swellings, but it is not like that; I made several attempts to find a filaria but failed." The patient informed me that he had first noticed the swellings in March, 1903. The swellings he describes as thickenings, hard in character and not pitting. They occurred mainly on the hands, also once below the eyelid. They had occurred on the leg, and then covered an extensive area above and below the left knee, and according to his statement only one swelling occurred at one time at one place.

When the patient was seen by me, a slight swelling on the ulnar side of his wrist (left) about as broad as a crown piece was observed; he stated that the swelling was of the same nature as the others he had suffered from. The swelling was not well marked, it was but slightly raised, somewhat elastic in consistency, and certainly was not hard, nor was there any redness or œdema; his temperature was not raised.

A blood examination was made for parasites with ordinary and thick films. The result was negative. In examining for parasites, however, it was observed that there was a distinct eosinophilia. Careful counts were then made of a number of slides, with the following results:—

Leucocytic count (600 counted):—

Large mononuclear	1
Small mononuclear	23
Polynuclear	26
Esinophil	50

Such a marked relative increase in eosinophile cells suggested a worm infection of one kind or another. No filarial embryos were found in the blood. The fæces were also examined for ova of worms, but the result was negative. The blood from the swelling itself was also examined with negative result.

I have thought it important to place on record the condition of the blood in this case, so that the blood of cases of "Calabar swelling" may be likewise examined. The nature of this case, however, is quite obscure, and I have called it "tropical swellings" for lack of a better name, and because Dr. Fletcher did not consider it to be one of "Calabar swelling."

XI.—NON-FLAGELLATE TYPHOID BACILLI.

By J. W. W. Stephens, M.D.Cantab., D.P.H.

These observations seem to me to prove not only that we have non-flagellate typhoid bacilli, but that the flagella can be restored by "passage" through animals. I think this is of importance in many respects.

(1) It shows that non-motility and the non-flagellate condition may not be characteristic of the bacillus, but may be an acquired character due to laboratory conditions of growth. How far other bacilli can lose their flagella remains to be seen. For instance, a very old strain of *B. pyocyaneus* examined by me was found to be actively motile, and, of course, to possess flagella.

(2) It will be necessary in certain cases, before we can state that a bacillus is non-flagellate, to examine

it as soon as isolated from the body, or to pass it through an animal. Thus in the case of *B. dysenteriæ* and other bacilli and cocci there is a certain conflict of evidence as to the presence or absence of flagella, which may be due to the age of the culture.

(3) If this bacillus "reacted normally" in the agglutination test of typhoid serum, then the presence of flagella cannot be an essential factor in agglutination.

(4) Biologically, the experiment is of interest as showing how profoundly environment can modify structure.

XII.—CLADORCHIS WATSONI (CONYNGHAM). A HUMAN PARASITE FROM AFRICA.[1]

By A. E. Shipley, M.A., F.R.S.

XIII.—THE INTERMEDIARY HOST OF FILARIA CYPSELI (ANNETT, DUTTON, ELLIOTT). THE FILARIA OF THE AFRICAN SWIFT, CYPSELUS AFFINIS.

By J. Everett Dutton, M.B.

The points of interest associated with this filaria are:—

(1) Up to the present it has only been found in one species of bird, *Cypselus affinis*, while other African bird filariæ are generally encountered in many different species.

(2) The habitat of the embryo is essentially the lymph.

(3) The louse, which acts as its intermediate host, as a general rule, belongs to a family, the members of which usually, though not always, are parasitic on one species of bird only.

(4) This louse does not exclusively feed on feathers, but sucks up blood, and probably to a greater extent lymph.

(5) The metamorphosis of the parasites is very similar that of previously known filariæ.

Translation.

SCHISTOSOMUM JAPONICUM, A NEW HUMAN PARASITE WHICH GIVES RISE TO AN ENDEMIC DISEASE IN DIFFERENT PARTS OF JAPAN.

By Professor D. F. Katsurada.

Of the Pathological Institute at Okayama.

(Translated from the "Annotationes Zoological Japonicum," vol. v., part 3, 1904, by Dr. T. S. Kerr.)

For some years there has been observed in certain parts of the provinces of Yamanashi, Hiroshima (both in Central Japan) and Saga (in Kinshu, north-west island), an endemic disease, of which the following are the chief symptoms: Enlargement of the liver and spleen, morbid appetite (occasionally the appetite is diminished), diarrhœa (frequent mucous and blood-stained motions), occasionally also fever, anæmia, cachexia, ascites, œdema, &c. A certain number of the patients die of extreme weakness.

Concerning the nature and cause of this disease up to now nothing certain is known, although Yamagiwa, Kurimoto, Fujinami and others have observed cases in which in several organs (more especially the liver), in cadavers from infected areas, numerous eggs of a hitherto unknown parasite were found.

I had an opportunity in April of this year of studying several cases of this disease in the province of Yamanashi.

In the fæces of 5 out of 12 patients examined I found peculiar ova, similar to those of *S. hæmatobium*. I conjectured that the disease was occasioned by these eggs and the mother beast, and that the latter would in all probability be found in the portal system. But I had at this time no opportunity of sectioning bodies of persons who had suffered from this disease. As I had already found out that trematodes (*e.g.*, *Distomum spathulatum* and *D. Westermani*), of frequent occurrence in man, were also not infrequently found in dogs and cats, I believed that there might be found in these animals a trematode which caused the disease in question. I therefore dissected two dogs and a cat, and in the latter I found part of a male trematode. The description of the aforementioned eggs and the trematode I published in the end of June of this year in Japanese.

Since then I obtained a second cat from the province of Yamanashi, and found in the portal vein and its tributaries numerous trematodes of the same species as that found in the first cat. This information I published on August 13th of this year, and I named the parasite *Schistosomum Japonicum*.

I should like to describe shortly in German the main features of this parasite.

I.—Description of the Eggs.

(1) *Eggs in the Fæces of Patients.*—These for the most part are oval or elliptical, have a thin shell, a double outline, and are of a yellowish or light brownish-yellow colour; there is no operculum. The egg-shell is nowhere provided with a spine like that of the *S. hæmatobium*. The measurements of ten eggs in a fresh state give on an average a median longitudinal diameter ·0835 mm. (·075—·09 mm.) median, transverse diameter ·0625 mm. (·0525—·0725). I also found in the fæces of another patient quite a small egg ·065 in length by ·04 in breadth.

Within the shell is a second very thin membrane which appears as a colourless and faintly refractile envelope, usually known as the yelk membrane, but better styled the shell membrane. Between the shell and the shell membrane is usually a narrow space.

The eggs evacuated with the fæces contained in most cases developed embryos.

The embryo has a longish oval body tapering from before backwards, and at its anterior end is a kind of proboscis. The cuticle is provided with cilia, which in the anterior body parts are characterised by their size and lively vibration.

Most noticeable in the internal anatomy of the embryo at its anterior end and in the middle of the body is a mass of yellowish, strongly refractile

[1] This article was published in the *British Medical Journal* of September 17th, 1904, and summarised in the Journal of Tropical Medicine, August 15th, 1904.

granules, which are perhaps comparable with the contents of the so-called stomach sacs of *S. hæmatobium*. In the centre of the body and at its posterior extremity are to be found several small granular cells, and also numerous highly refractile spheres whose structure is not recognisable. The size and distribution of the spheres is very irregular. The two large glands which in *S. hæmatobium* are found next to the intestines, I am not sure about.

About this part within the shell membrane is usually found a clear semi-fluid substance.

In the fæces comparatively few eggs containing only a granular mass are to be found.

The nature of the eggs is very like that of *S. hæmatobium*, and leads to the conjecture that the parasite must belong to the same genus.

(2) *Eggs in the Tissue of Men and Cats.*—These I observed in three human livers and one human intestinal wall. To Drs. Shimodaira and Muramatsu, who very kindly gave me the material, my best thanks are due.

The typical form (oval or elliptical) is still retained by a certain number of the eggs in the human tissues. Inside the thin egg-shell is a granular mass, or a miracidium provided with cilia; the measurements of twenty-five eggs from a human liver gave on an average, length ·072 mm., breadth ·9 m.m. The description of the eggs already shows that they are of the same kind as those found in the fæces of patients from Yamanashi province. But the eggs in the tissues are somewhat smaller than those in the fæces; this can be readily understood, for the eggs in the tissues are more or less influenced by their surrounding conservative media.

Besides the typical eggs a proportion of more or less divergent forms are found in the tissues, namely, broken egg-shells, into which leucocytes have migrated, and long spindle-shaped transformed eggs with calcareous contents, calcareous matter being also found in eggs which retain their characteristic form. Moreover, I observed eggs in the two cats.

Cat I., in which I found the first specimen of a male of one parasite, had lived for over eleven years in the village of Okamada (a well-known endemic area) in the province of Yamanashi. The liver of this cat, macroscopically, was distinctly altered, and in it were found numerous eggs, amongst which were relatively rare those of characteristic shape and containing typical embryos. Broken portions of egg-shell were found here and there, and even when the egg-shell retained its shape it frequently contained many small cells and even foreign body giant cells, but no embryo. At times, in consequence of the calcareous matter, the structure of the contents can no longer be recognised. The average measurements correspond with those of the ten eggs, and they are fairly regular in shape; length ·07 mm., breadth ·047 m.m.

Cat II., like *Cat* I., had lived for over two years in the village of Okamada. In the portal and mesenteric veins of this cat I found large numbers of a species of parasite which I called *S. Japonicum* Microscopically I recognised its eggs in the liver, the bowel wall, as well as in the large intestine. Amongst these were many comparatively fresh eggs, in which the egg cells and vitelline cells could be recognised unchanged. There were also embryo containing ova, but comparatively few. The average measurements of thirty eggs from the liver were length ·064 mm., breadth ·047 mm.; the average measurement of ten eggs from the large intestine which contained developing embryos being ·067 mm., breadth ·05 mm. It is apparent that the size of the egg varies with its stage of development.

(3) *Eggs in the Uterus of the Mother Beast.*—The same description is in the main applicable to these as to the ova in the fæces of patients and in the tissues of men and cats, but in them are found no embryos, only egg cells and vitelline cells. In the relatively narrow uterus in which the eggs are crowded together they assume various shapes; seven eggs can be seen in a transverse section of the uterus. The measurement *in utero* of ten eggs regularly formed was, length ·0584 mm., breadth ·0425 mm. It is also in the uterus that the smallest ova already described are to be seen.

II.—Description of the Worms.

The sexes of the parasite are distinct, and their bodies are very dissimilar. The body as a rule is small and slender, varying, however, in the same sex; for the most part it is of a dirty white colour. Nearly the whole posterior half of the female is darker, usually almost black, and in this portion the vitellogene gland is greatly developed, the gut being filled up with a quantity of blood-coloured material.

(1) *The Male.*—In spite of the large number examined I was only able to obtain measurements in eight, as many were more or less destroyed in handling. The results of these measurements were as follows:—

No.	Body length (mm.).
1	12
2	11
3	10
4	12
5	10
6	10
7	7
8	11·5
Average	10·43

Despite these measurements I do not accept them as the standard of the parasite, as all of them were found in small hosts (cats). Parasites found in man in whom they had lived a long time might perhaps become much larger.

The body is for the most part flat, but in its posterior section is a canal produced by infolding of the sides (gynæcophoric canal) which serves for the reception of the female. The mouth and posterior sucker lie close to each other in the anterior part of the body; the mouth sucker is funnel-shaped; the posterior sucker is a little bigger than the anterior sucker, and is armed. In a male 12 mm. long, measurements show the diameter of the anterior sucker to be ·29 mm., the posterior sucker ·33 mm. There are also males which possess somewhat larger suckers. The anterior body in the male measured ·8 mm. from the posterior lip of the posterior sucker

to the anterior extremity; the breadth in the centre of the anterior portion was ·35 mm. The greatest thickness, usually a little behind the centre of the body, is ·53 mm. It is to be noted that the thickness of the body is very variable, according to the greater or lesser infolding of the sides of the body. On section of a well-developed male, ·48 mm. at its thickest part, I found that the breadth of a female which was lying in the gynæcophoric canal measured at the point of section ·37 mm. The posterior end is tapered. The suckers are beset with very fine spines, and the cuticle in the gynæcophoric canal has similar spines, but not so closely set. On the back there are neither spines nor tubercles as in *S. hæmatobium*.

Next is to be seen a single œsophagus usually surrounded by numerous glands; behind this commences the alimentary tract with a dilatation ·29 mm. in diameter, which then divides into two cæca. The bifurcation of the cæca is just in front of the posterior sucker, and they again unite sooner or later into a central trunk. The point of juncture varies more or less: it is to be noted, however, that the junction of the cæca in our parasite is rather further back than in *S. hæmatobium*, although very similar to it. In a male a little over 10 mm. in length, the junction of the cæca is only for a short distance, somewhere about 1·6 mm.; the point of junction is in the posterior sixth of the body. It is also to be noted that the cæca unite now and again for a short distance. The cæca have a sinuous and zig-zag course. The excretory pore is at the posterior end, and lies somewhat dorsally. The contents of the cæca, everywhere more or less abundant, are chiefly polynuclear leucocytes mixed with a few coloured granules.

Between the cæca in front of the posterior part of the body lie at most six testicles, closely packed together, which lead into an excretory duct. The sexual apparatus lies immediately behind the posterior sucker at the entrance to the gynæcophoric canal.

(2) The female is cylindrical, tapering from before backwards; the greatest diameter is just behind the middle of the body. The cuticle is smooth, only in the suckers are spines to be found. Of those seen only a few were intact; the length is from 8 to 12 mm. It is to be noted that still larger females will occasionally be found, chiefly in man.

The suckers are close together; the anterior sucker in a female 11·5 mm. long was ·063 mm., and is a little smaller than the posterior sucker, which in the same female was ·074 mm. Measurements of this female were, of the anterior body ·29 mm. long, breadth in the middle ·068 mm., behind the posterior sucker ·088. The greatest thickness of the female is ·4 mm.

The œsophagus lies in the anterior part of the body just as in the male; the bifurcation of the cæca is immediately in front of the posterior sucker. Behind the ovary both limbs unite, the single trunk running in the middle line to the tail end, where it ends in a *cul de sac*. The intestine throughout its course is more or less zig-zag, occasionally spiral. The contents of the cæca are usually considerable, consisting chiefly of yellow-brown pigment cells and a few leucocytes; these pigment cells are found not only in the single portion, but in both cæca. It is to be noted that the single portion of the cæca of the female is considerably thicker than that of the female *S. hæmatobium*. According to my measurements the transverse diameter in a well-developed female was ·234 mm., whilst according to Leuckart the single duct of the Egyptian species measured only 0·4 mm. Cross section of the single cæca of a male sectioned with the aforesaid female showed it to be a longish oval, its greatest diameter being ·055 mm.

The excretory apparatus is well developed and similar to that in *S. hæmatobium*.

The ovary lies in the centre of the body, and is of a longish oval shape. In the female 11·5 mm. long, already alluded to, my measurements showed it to be ·59 mm., in another female 8 mm. long it measured ·39 mm. The oviduct springs from the hinder end, winds round to the front, and joins in with the vitello duct in front of the ovary; here the shell gland opens. The common canal widens out up to the ootyp, and becomes then the uterus in its central part up to the genital pore, which lies immediately behind the posterior sucker. The vitellogene glands lie behind the ovary, and reach quite to the posterior extremity; the vitello duct runs almost medially alongside the single cæca.

That the vitellogene gland does not occupy quite the half of the whole body, and that the uterus for this reason occupies rather more than the anterior half is, compared with *S. hæmatobium*, an important difference. In the main our parasite is very like *S. hæmatobium*, though certainly a different species.

III.—Pathology.

The parent worms in men and cats are usually found in the portal vessels and their tributaries, as well as in the mesenteric veins.

The food of the worms must naturally be the blood of their hosts; removal from the blood demonstrates the presence of numerous blood-stained parasites. It may also be that the blood corpuscles of the host, owing to the presence of the worms, are destroyed more or less mechanically. The worms, in all probability, by a process of assimilation produce some toxic materials which perhaps cause enlargement of the spleen.

The eggs give rise to embolism in several of the organs, most frequently the liver, in which they excite inflammation and widespread thickening of the tissues. In consequence of this the liver sooner or later shrinks, and a kind of cirrhosis results, whereby the capsule of the liver becomes granular, thickened, and irregular.

The foregoing appearances in the liver are the phenomena produced more or less by stasis. Moreover, in most cases eggs are found in the intestinal mucosa and sub-mucosa, especially in the large intestine. The deposition of the eggs induces more or less severe inflammation, which leads in parts to tissue disturbance, in parts to tissue growth; infiltration in the bowel wall follows, and that frequently terminates in ulceration of the mucous membrane.

As the eggs of the parasite readily alter their form according to their environment, and are consequently able to pass through relatively small spaces, they will be carried by the blood stream throughout the body, and deposited in small numbers in all the organs.

I may here cite Yamagiwa's case, in which owing to the deposition of these eggs in the cortex of a man from the province of Awomori, the so-called Jacksonian epilepsy was induced. At the time Yamagiwa thought the parental form to be *D. Westermani;* he now admits this was not the case.

It is to be noted that hitherto no bladder lesions have been observed in our parasite, which is nearly always the case in *S. hæmatobium.*

The manner of infection is not yet certain; probably it is through drinking worm-infected water. Whether through bathing in dirty water the infection could obtain entrance through the skin remains a question. It is at all events worthy of notice that floods, as in Egypt, are frequent in the regions regarded as infected. Caution should, moreover, be used in the use of raw vegetables, molluscs, and fish.

In conclusion, it is my pleasing duty to convey to Professor Dr. I. Ijima my sincere thanks for his valuable advice in the publication of this work. To Professors Suga, Mikami, Kubo, and Shenda for their kind assistance I am much indebted.

Okayama, October, 1904.

POSTSCRIPT.

Since the preparation of these pages, Fujinami, in the *Kyoto-Igahu-Zasshi* (vol. i., pamphlet 3, end of October, 1904), states that he has found a female *S. japonicum* in the human body.

It is unfortunate that this female was in parts damaged; still, this valuable find opportunely confirms my discovery.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Bulletin Général de Thérapeutique" December 30, 1904.

Treatment of Beri-beri. By Ulysse Paranhas.

Continuous electric currents are recommended by means of the negative pole in a foot-bath and the positive on the spine, or local application to the nerves of a 10-20 milliampère current to the nerves for fifteen minutes daily. Faradism is of use when the muscles are weakened, giving 100-200 interruptions a minute.

Tepid douches with the patient reclining; if reaction follows, a warm foot-bath, given before or after the douche, relieves. Massage gives great relief.

Internally organic arsenic, as arrhenal 1 gm., water 20 cc., ten drops in half a tumbler of milk at bedtime.

The author is favourably impressed by marapuamah (*Livicosma ovata* of the order *Olacacea*) in ounce doses daily—that is, half an ounce twice a day after meals. The drug has the advantages of strychnine without its disadvantages. As a general toxic the glycerophosphates are recommended, 4 grammes of the soda salt in 200 cc. of water; of this 2 cc. are hypodermically injected daily.

For dropsical cases theobromine 2 grammes daily in our doses in cachets, to which may be added 0·25 doses of phosphate of soda. Purgatives, elaterium (English) gramme 0·5, extract of rhubarb 60 grammes, to make six pills, one every half hour, and German brandy, *i.e.*, tr. jalap Co. codeia, flavoured with syrup of prunes.

For pulmonary œdema, caffeine, dry cupping, and inhalation of oxygen, and calomel for congestion of the liver.

T. B. P.

"Journal of the American Medical Association," January 21, 1905.

Dengue in the Isthmian Canal Zone, including the Report of the Laboratory Findings. By D. Carpenter and R. L. Sutton.

During the spring and summer of 1904 Drs. Carpenter and Sutton undertook a prolonged and careful enquiry into the pathology of dengue. They examined the blood, but were unable to confirm the presence of the micrococcus described by McLaughlin, of Texas, in the *New Orleans Medical and Surgical Journal* of 1885 and the *Texas Medical News,* 1895-6. No micro-organisms of any kind were found in the blood of patients suffering from dengue.

In experimenting upon the conveyance of dengue by mosquitoes, the following species were utilised: *Culex consobrinus* (Desv.); *C. stimulans* (Walk.); *C. tarsalis* (Coq.); *C. tæniorhynchus;* the *Conchyliastes posticus* (Wied.); and the *Stegomyia fasciata.* Neither in the stomach nor salivary glands of any of these mosquitoes were any bacteria, piroplasma, or zygote forms found.

Inoculation experiments were unsatisfactory, as other methods of infection were not excluded.

Scheube ("Diseases of Warm Climates") and Clayton ("Encyclopædia Medica") have described a moist climate and a high temperature as predisposing factors in dengue, combined with overcrowding and insanitary conditions generally. There is a marked resemblance at times between cases of influenza and dengue. Swabs from the throat showed leptothrices and streptothrices in numbers, and a small diplococcus free or in epithelial cells. The same diplococcus was also found in pus from a "tropical" bubo. The result of the observations tended to show that:—

(1) In dengue a leucopænia is present from the first.

(2) Blood examination serves to exclude malaria as a cause of dengue.

(3) Albuminuria is rare; the opposite obtains in yellow fever.

(4) It is suggested that the causative agent is a small diplococcus or a delicate bipolar staining bacillus closely resembling Pfeiffer's organism.

(5) Infection is probably by way of the respiratory tract.

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Notices to Correspondents.

1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the JOURNAL OF TROPICAL MEDICINE should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communications.

AN UNDESCRIBED FORM OF ULCERATION OF THE LARGE INTESTINE, PROBABLY OF AMŒBIC ORIGIN, CAUSING IN SOME CASES ABSCESS OF THE LIVER.

By T. C. Mugliston, M.R.C.S., L.R.C.P., and L.M.,
Colonial Surgeon, Penang;
AND
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Colonial Surgeon Resident, Penang.

We present this paper to you as we think the condition of the large gut described by us has not been hitherto recorded, nor the influence of it on the formation of liver abscess previously recognised.

At the Annual Meeting of the British Medical Association in Manchester, in 1902, there was a discussion in the Tropical Section on the causation of liver abscess, and particularly on the part played by dysentery in causing that condition.

By some it was held that liver abscess was always due to dysentery, while others thought that in many cases there was no history of dytentery. As somewhat of an explanation of the latter view we venture to bring the following cases to your notice, and suggest that the conditions found by us *post mortem* have not been hitherto described.

They cannot be confused in any way with ordinary dysentery as seen clinically, on the *post-mortem* table, or as described in books.

Dysentery is described as a fever, accompanied by frequent stools of blood and slime; the stools having a distinctively putrid smell. With these conditions there is great pain in the abdomen, tenesmus, and often complete prostration. *Post mortem* the large intestine exhibits an engorged, inflamed and often sloughing appearance.

In the condition we describe there may be little or no fever in uncomplicated cases. The patient usually states that he has felt unwell for a week or more, that he has undefined pains in the abdomen, and that his motions are more frequent than usual. The temperature is usually found to be about 99° in the morning and 99·5° at night; in some cases normal all day. The motions may be as frequent as one every hour in the day, and every two hours during the night. The stools are not offensive, but are full of jelly-looking slime, with only a few streaks of blood. On abdominal examination some tenderness is found over the ascending and transverse colon.

The patient, if wise enough to stay in bed and adhere strictly to milk diet, usually reverts to healthy motions in three weeks, the stools improving in character after the first ten days.

Situation of Abscess.

If, on the contrary, the patient refuses to be guided as above, or thinks he is not sufficiently ill to seriously seek advice, he is finally attacked by rigors, accompanied by a rapid rise of temperature to 104° or 105°. Severe pain, increasing day by day, is felt over the region of the liver, and other symptoms of liver abscess supervene. At this stage, although an abscess may be present, which it usually is on the under-surface of the right lobe, it may be very difficult to find, and, if found, to satisfactorily treat. We have seen the liver pierced in all directions, and an abscess in the liver at a point opposite the beginning of the transverse colon escape puncture.

We believe that cases such as these are of more frequent occurrence than is supposed, and that the milder or more lucky ones may even be of the ambulatory type throughout, and so escape notice.

It is, of course, impossible to say whether the milder cases have the same pathological condition underlying them as in the two cases described below, but, as there is nothing at the onset to distinguish them clinically, the importance of early treatment in all will be sufficiently obvious.

It is to be noted that all our noticed cases have so far been in Europeans, but of a large number of *post-mortem* examinations made in dysentery and diarrhœa cases in natives—chiefly Tamils and Chinese—we have not yet found the characteristic circular ulcers of the large intestine hereafter described.

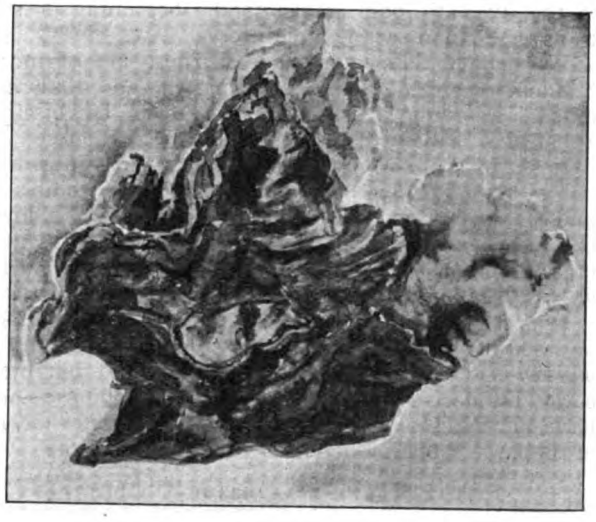
Situation and Nature of Ulcers.

In the two following cases, which we have happened to have seen together, the dysenteric condition was associated with liver abscess, and towards the end with uncontrollable hæmorrhage from the bowel. Both proved fatal, and at the *post-mortem* examination, instead of the ragged, irregular ulceration affecting a considerable portion of the large intestine one would have expected, there were present in the cæcum and adjacent part of the ascending colon a few symmetrical ulcers, round or oval in shape, with raised rounded edges somewhat undermined. If they had been present in the small intestine, one would at first have put them down as typhoid ulcers. Both patients were Irishmen and prominent Government officials. Although the description of the first case is from recollection only, it made so great an impression on our minds that several times during our attendance on the second patient we were reminded of it by the symptoms, and expressed the hope that that would not prove to be similar.

Case 1.—The first case occurred in Singapore some years ago. The patient had had what seemed to be merely a very mild attack of dysentery for two or three weeks before admission to hospital, and most of this time was going about his ordinary work. Signs of a liver abscess then developed, and for this he was operated upon a few days after admission. Instead of improving his condition became worse, the temperature kept up, the dysenteric symptoms more troublesome, large quantities of blood being passed *per rectum*, and he died a week or ten days after the operation. It was thought it might be a case of multiple abscess of the liver, but at the *post-mortem* examination only a single abscess was found, and in the large intestine the characteristic symmetrical ulcers just mentioned.

Case 2.—The second case occurred in Penang recently. He first sought medical advice on August 9th, 1904. He said he had not been feeling fit for some

time and lately had noticed a little blood and slime in his motion. He thought he must have eaten something which had disagreed, and wanted a "good clear out." He was given a dose of castor oil and chlorodyne, and a few days afterwards said he was



Ulceration of Large Intestine.

all right, but constipated. Drachm doses of sulphate of soda with dilute sulphuric acid and peppermint water were then prescribed. On August 24th fever began, and afterwards (*vide* chart) assumed an irregular remittent type, accompanied at first by rigors every eight hours. A microscopical examination of the blood showed what appeared to be ring-form parasites in the red cells; but quinine, both by mouth and hypodermically, had little effect on the temperature. Retching and vomiting were at this time troublesome symptoms. Constipation was still complained of, and on August 26th, after a consultation, he was ordered a grain of calomel every two hours until the bowels acted. At this time no enlargement of the liver could be made out, the upper limit being lower than normal, only extending as high as the upper border of the seventh rib near the sternum; but there was a suspicion of a friction sound at the right base.

On August 27th the bowels were open several times, the motions containing a little loose fæcal matter, with a good deal of jelly-like mucus and a few streaks of blood.

On August 28th he came into hospital, and was put on a mixture containing quinine and sulphate of magnesia. The same afternoon he passed a semi-consistent bile-stained motion, containing no blood or mucus, and later on several watery motions. Urine high coloured, acid, sp. g. 1030, no bile, albumin, or sugar.

August 29th.—Passed several watery pea-soupy motions. Magnesia sulphate mixture stopped, and put on the chlorine mixture of Burney Yeo. Widal's test for typhoid gave a negative result.

About 11 p.m. had sudden severe pains in right shoulder, right side of chest, epigastrium and right iliac fossa. Said the pains were the worst he had ever felt in his life, and he was afraid to breathe.

August 30th.—Slight friction sounds audible external to right nipple, and over the base of the right lung. At 11 p.m. similar pains to the previous night but less severe, the pain most marked in epigastrium and right iliac fossa.

August 31st.—Had a good night after hypodermic injection of morphia; could expand his chest now with less pain. Remarked that when his temperature falls the pain almost ceases, and reappears when it rises.

September 1st.—In the morning passed two copious motions, chiefly blood-clots with a little semi-consistent fæcal matter. Microscopical examination showed only blood corpuscles, no pus cells. Given pil. plumbi c. opio grs. iij.

September 2nd.—Liver dulness increased upwards to upper border of the sixth rib. At 7 p.m. severe pain in right lumbar and right iliac regions, relieved by application of hot-water bottle. Bowels not acted since previous day.

September 4th.—Severe pain all over liver when moved. Liver dulness lower in epigastric region than previously. Bowels open three times, semi-consistent bile-stained motion.

After consultation, chloroform was administered, and the liver explored in several directions with a full-sized aspirating needle; 7 or 8 ozs. blood drawn off, but no pus found. There was no vomiting afterwards, and he expressed himself as feeling much easier and free from pain.

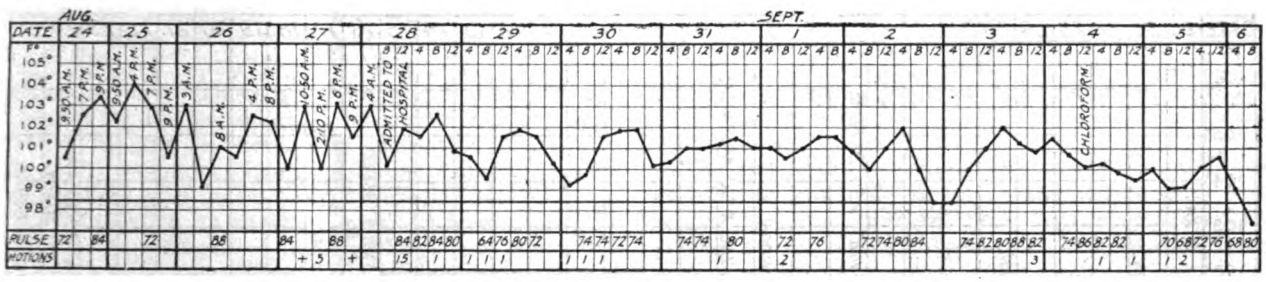
September 5th.—Icteric tinge noticed about sclerotics. Passed three semi-consistent bile stained motions.

September 6th.—Passed in night two formed milk motions with a little blood. About 11 a.m. he was noticed to be looking very pallid; extremities cold; said he felt faint. At 1.40 p.m. he began to pass large quantities of dark blood and clots *per rectum*. Ice-packs to the abdomen, starch and opium enemata, suprarenal extract, and subcutaneous injections of saline solution were all used, but the hæmorrhage

Ulceration of Large Intestine.

from the bowel continued, and he died the same evening.

A partial *post-mortem* examination was held on the following day. On opening the abdomen and chest cavity there appeared to be at first sight very little abnormal, and no signs of peritonitis; but on pulling



TEMPERATURE CHART.

the intestines on one side a large abscess, almost on the point of rupture, was found on the under-surface of the liver posteriorly. On opening the intestines no ulceration was found in the small intestine, but in the cæcum, and just above, in the ascending colon, were five ulcers similar to those in the first case, the largest rather bigger than a 20 cent piece. One of these had almost perforated, and its situation was marked on the outer side of the gut by a reddened and congested patch. Nothing else was found to account for the great hæmorrhage from the bowel during life. There was a little serous fluid in the right pleural cavity.

Microscopical examination of the pus from the liver abscess showed what we thought were amœbæ.

Specimens of the liver were sent to Dr. Low, of the London Tropical School, who very kindly examined them, and reported that amœbæ were present in the necrosed tissue at the edge of the abscess.

The finding of the *Amœba coli* in this case points to the variety of dysentery described belonging to one of the amœbic forms. Possibly the majority of cases of dysentery seen out here belong to the non-amœbic forms, of which bacteria are believed to be the causal agents. This is only thrown out as a suggestion, as no systematic examination of the stools of dysentery cases for amœbæ has been made here. Again, as Manson says, although *Amœba coli* is a very probable cause of one form of dysentery, it has not yet been conclusively proved to be so.

Abscess of the liver, usually single, appears to be a very common complication of so-called amœbic dysentery, and, according to Lafleur, who writes the article in Clifford Allbutt's "System of Medicine," the prognosis in these cases is most unfavourable. "Even when the dysentery is latent, that is, when there are no actual intestinal symptoms, the outlook is not much better; for an exacerbation of the intestinal condition is very apt to occur with the development of the hepatic complication. Surgical intervention is not, as a rule, followed by such satisfactory results as in the case of non-amœbic abscess."

One of us has seen yet another case in a European in which at *post mortem* an ulcer was found adherent to the very thin wall of the abscess cavity.

[NOTE.—The specimens of cæcum and ascending colon from which the illustrations which accompany this paper had been taken had been preserved in formalin, and the appearance of the ulcers is therefore less symmetrical and more shrunken than when fresh.]

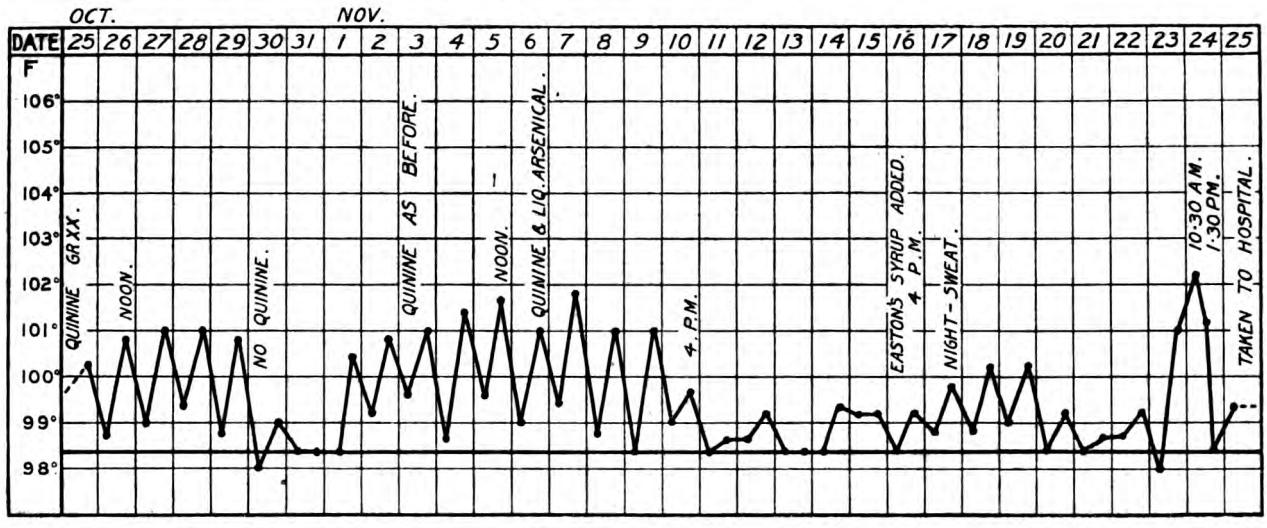
A PUZZLING CASE.

By A. B. DALGETTY, M.D., D.P.H.,
South Sylhet, India.

THE subject of "continued fevers" is often a very difficult one for the practitioner in the Tropics, and all his somewhat limited resources are sometimes called up to enable him to unravel the tangle: the latest discussion on the subject at the last British Medical Association meeting at Oxford did not help to clear up the difficulties very much—chiefly for want of well-ascertained facts and data to build upon. The presence or the absence of enteric fever in any given case is often a difficult thing to decide, in spite of the specific serum test and other tests. The following case will show some of the difficulties connected with the so-called "continued fevers."

H. G., a tea-planter, aged 30, had been in India for seven years; he had occasionally suffered from malarial fever, but not more so than others, and on the whole had kept good health. It may be mentioned here that he was rather subject to abrasions of the knuckles and backs of the hands caused by slight injuries, and these were difficult to heal, tended to fester and to undermine the surrounding skin, and took rather a long time to clear up. This tenderness of the skin, however, is a common condition in the Tropics, especially in the hot season. The upper layers of the skin seem to be very easily abraded, probably owing to the skin being continually sodden with perspiration, and thus becoming readily invaded and undermined by the organisms of suppuration.

At the beginning of September, 1903, the patient had been playing a hard game of tennis, and instead of changing his damp clothes as the usual custom is, had sat down between two doors in the coolest place he could find. Such was the information he gave me when two days afterwards I was called in to see him. He was in bed lying partly on his right side and face, slightly feverish, with a furred tongue, and complaining of severe pains over the lumbo-sacral region, much increased on movement. It looked like a simple lumbago, so I prescribed a purge, hot fomentations and an anodyne liniment. By the end of a week the pains had become easier, and one day he got up and went out for a few hours, but had to return and go to bed again. The condition remained unchanged for the next ten days—slight fever, usually towards evening, lumbar pains, loss of appetite, sleeplessness. At this time he had a sharp attack of diarrhœa, which he attributed to an overdose of Epsom salts given him by the doctor-babu; but this diarrhœa is of some



significance in the light of what followed. A little accident happened about this time, too—he swallowed about a tablespoonful of the lin. belladonnæ in mistake for a sleeping draught which he was taking; but the quantity was not great enough to cause any trouble beyond some irritation of the fauces and a slight alarm

On October 10th he began to have regular attacks of fever, coming on about 6 p.m., and lasting most part of the night, but remitting towards morning. The lumbar pains were much less, so that he could lie on his back; but he now began to complain of sharp stabbing pains under the left ribs in the region of the spleen, sometimes shooting down the thigh; movement of limb aggravated the pain, and a slightly flexed position of the leg was the most comfortable; the pain was always worst, too, at the beginning of the rise of temperature. The spleen could just be felt, but no other swelling nor actual tenderness could be detected by pressure in the iliac region. The abdomen was flat, resonant, and there was no fulness nor gurgling around the cæcum; the heart, liver and other organs were normal. Two blood films taken just before an expected rise of temperature showed in the fresh state numbers of small, actively mobile, hyaline organisms, some free and some within the red blood cells. Stained by Jenner's method the same organism was seen, sometimes double, inside the red cells. So far it was clear that he was suffering from malarial fever, with the æstivo-autumnal hæmamœba present. For some time he had been taking quinine amounting to as high as 25 grs. of the sulphate in twenty-four hours, yet the living hæmamœbæ could still be found, as proved on this occasion and on many subsequent occasions.

Since he was making no progress and resided at some distance I had him removed to my bungalow on October 24th. Next morning I gave an intramuscular injection of 20 grs. of quinin. acid. hydrochlor, and later 10 grs. by the mouth; but the temperature rose in the afternoon as usual. From this date onwards the temperature chart will show the course of the fever. During the next fortnight the temperature ran up to 101° F., or a little over, at noon, and fell to about 99° F. towards morning, only once having touched the normal line. This short interval of apyrexia coincided with a period of two days when the daily dose of quinine had been withheld, but on the following day the old oscillations began as before, although no quinine was given for two days more. The patient was now in a very weak state, although the tongue kept fairly clean, and he was able to take a fair amount of nourishment. The aspect was that of a typhoid condition, with great mental depression and a little "wandering" at night. On October 29th I made the following note: "Heart normal, pulse full, soft, dicrotic, 85 per minute. The right lung showed slight dulness from the third to fifth rib in the nipple line, and extending round the axilla to the mid-dorsal line, but there was no cough, no pain, no crepitation, and no friction sound. Left lung normal, liver normal, spleen slightly enlarged, no swelling detected in left lumbar or sacral region, whence the pains radiate; left leg still held in position of slight flexion." Blood films taken showed the same mobile, hyaline organisms as before, and also a very considerable leucocytosis. Although I was unable from want of apparatus to make an exact blood count, a considerable experience of blood work enables one at once to say whether the leucocytes are increased or not in a given case. Allowing three leucocytes to an average field of normal blood evenly spread and examined with a $\frac{1}{6}$ in. objective, in the present instance sixteen fields counted gave ninety-nine leucocytes, or an average of say six to a field, just double the normal number. A differential count gave the following result: Small lymphocytes 18, large lymphocytes 9, polymorphonuclears 65, and eosinophiles 7 per cent., showing a slight decrease in the percentage number of small lymphocytes, an increase of mononuclears, and a very marked increase of eosinophiles. The malarial element would account for the increased number of large mononuclears, but the eosinophiles are difficult to account for unless due to the administration of antipyrin and quinine, or to the anæmia caused by the prolonged malarial fever (Cabot). At the same examination I drew a drop or two of blood into a pipette and sent it off to the Government Laboratory at Naini Tal to be tested by the Widal method; for, although enteric fever is unknown in the tea districts, and the patient's symptoms, apart from the continued remittent fever and general typhoid state, were not

very suggestive of that disease, yet there was a possibility of infection, since it was known that the patient, when out at work, was in the habit of drinking unfiltered water from the hands of the native water-carriers. This supposition would, however, not account for the considerable leucocytosis, since there is not usually an increase of leucocytes in typhoid fever; it was more suggestive of a suppurative process somewhere, and that not of a tubercular nature.

The question as to whether enteric fever exists in a mild form unrecognised amongst the general population of India is a very difficult one to determine. Slight fevers and frequent diarrhœas are so rife that they have little diagnostic value, while the general application of the serum test is out of the question, and the results often not to be depended upon alone.

The temperature continued to rise, reaching a maximum about noon, and declining towards evening. On November 9th slight hypostatic congestion of both lungs was noted, the other lung symptoms remaining as before. The treatment was of a general nature. So long as the *Hæmamœba malariæ* was present it was right to give quinine, which he was given in doses of not less than 20 grs. in the twenty-four hours, sometimes by the mouth, sometimes intramuscularly. Antipyrin was also given, and from November 6th to 16th liq. arsenicalis, 10 mins. twice a day, was given in addition to the quinine, and after the later date the syr. ferri phos. c. quin. et strychn. was given in half-drachm doses twice daily in addition. The bowels were kept open with small doses of colocynth and hyoscyamus. To return to the Widal test: six days after the dispatch of the specimen a telegram was received from Naini Tal, saying that only veterinary work was done there, and that the specimen had been forwarded to M. Haffkine, Bombay. On November 11th M. Haffkine telegraphed the following message: "Reaction for enteric fever strongly marked." This positive result seemed to confirm the suspicion that the patient was suffering from enteric as well as from malarial fever, and accounted for the failure of quinine to destroy the malarial parasite. There was no history of a previous attack of enteric fever. But the leucocytosis had still to be explained, and the stiffness and pain in the region of the psoas muscle were still present. The slight pulmonary symptoms noted above appeared to be purely of a passive nature and gave no trouble. From November 10th the temperature touched the normal line on one or two occasions, and did not afterwards reach so high a level as before, except on the 24th, when it registered 102°·2 F., the highest point touched during the whole illness. On the night of the 17th and frequently afterwards at night there was night-sweating, the patient waking up soaked in a cold perspiration. This is a symptom by no means exclusively connected with pulmonary phthisis. He had now been ill nearly three months, and as the nursing was rather difficult I took advantage of a fall in the temperature on November 25th to have him removed to Calcutta to hospital. He stood the long journey better than could have been expected, and the temperature was little raised. From this time onwards I regret that I have no detailed account of the case to give; but about three weeks afterwards I received a letter from the house surgeon to say that a large retroperitoneal abscess had been opened in the left loin, and that the patient was in a grave condition. However, he slowly improved, and six weeks later was able to proceed to England. He remained there for eight months, and returned to this district perfectly well again in November last.

The case was certainly a complicated one, and it is even now not easy to say what was exactly the original trouble. Malarial fever he certainly had, as shown by the parasites present. Did he also have enteric fever, as the serum test seems to show, or were the typhoid symptoms caused entirely by the deep-seated abscess? It seems to me that he really had a chronic abscess, accompanied by malarial fever, and that the positive Widal reaction was fallacious.

TREATMENT OF MALARIAL FEVER BY INTRA-MUSCULAR INJECTIONS OF QUININE.

By L. E. Ashley-Emile.

Sydenham Hill Sanatorium, North End, Port Elizabeth, South Africa.

Having read the articles in the Journal of Tropical Medicine on the treatment of malarial fevers by intramuscular injections of quinine, and the unpleasant experiences of some who have practised this method, I resolved to give the method a fair trial on strict aseptic principles, and during the past year I have had exceptional opportunities of doing so, and have treated some fifty cases, giving in all sixty-eight injections without a single accident.

I shall, therefore, point out as briefly as possible the plan which I adopt.

Technique. — Hands are carefully prepared, are washed from above the elbows down in warm water with biniodide soap, and nail-brushes kept in antiseptic fluid in air-tight glass boxes used freely, the arms and nails are several times well soaped, and the pared nails subjected to repeated cleansings; the arms and hands are both finally covered over with 1 in 1,000 sublimate solution, and are pressed down and kept for a few minutes in a basin of equal parts of sublimate solution, 1 in 1,000, and absolute alcohol, which solution is also carried over the arms

Site to be Operated Upon.—Wash thoroughly with antiseptic soap (the biniodide to be preferred) and warm water. A fresh piece of lint is used on each occasion, then rubbed with Scrubb's cloudy ammonia fluid, either pure or diluted in case of delicate skins, in order to remove all grease, until lint shows entire absence of dirt; the part is next scrubbed with carbolic lotion, 1 in 20, and finally with absolute alcohol; a pad of lint soaked in the same is left on the part while the injection is being prepared.

Appliances, such as syringe, test tubes, &c., are well washed in warm water, and, if there is no urgency, kept for an hour in carbolic lotion, 1 in 20, and washed with absolute alcohol before use.

Preparation of Solution.—Having filled the syringe (mine contains 20 minims) with water to ascertain amount required, it is emptied into a sterilised test tube and boiled over a spirit lamp. One grs. 5 "Tabloid" of

quinine hydrochloride is dissolved, and the solution repeated to a second boiling, the result being a slightly turbid solution, a drop or two of strong HCl. is added, which dispels the turbidity, leaving the solution quite clear. Syringe is filled, all air expelled, and the needle passed once or twice through the flame of a spirit lamp, and the injection is ready for use. The selected muscle is pinched up, and the needle thrust vertically deep into it while the fluid is warm. Slight pain is experienced at this stage while the fluid is being injected, but passes off on completion. The fluid is injected slowly and intermittently; needle is kept *in situ* for a few minutes, and the lump which forms is gently stroked with fingers of left hand to aid absorption, after which the needle is rapidly withdrawn; the left index-finger is placed over the puncture point and kept there until the skin contracts and completely closes the orifice. Puncture may be smeared with vaseline, but I prefer painting the site over with liniment of iodine, as advocated by Dr. Sims, of Congoland. A pad of lint soaked in absolute alcohol is applied, and covered with a larger piece, and maintained in position by a few strips of adhesive plaster.

Bearing in mind the unpleasant complications which may arise from this method, viz., abscess, tetanus, &c., I am of opinion that this plan should not be adopted as a routine therapeutic measure for all cases of malarial fever, but reserved as an invaluable adjunct to the ordinary method for intractable cases where quinine cannot be administered and tolerated by the mouth, as in certain remittent and pernicious types of the disease, when accompanied with excessive vomiting and pronounced nervous symptoms, with delirium, and especially in malarial coma.

When to Use Quinine Hypodermically. — I have found this plan most effective in reducing the temperature of persons who have by excessive daily usage established a tolerance for the drug, and in whom 40 to 60 grains of quinine given by the mouth has failed to produce the desired result, when a single injection of 5 grs. of quinine has lowered the temperature. I can recall to mind two such cases in my series where quinine, given in large doses by the mouth, entirely failed to reduce the temperature; and the patients rapidly passing into a moribund condition, but for the timely injection would most assuredly have succumbed. Thus encouraged by my success, I now adopt the routine practice of exhibiting quinine injections if on the third day the temperature still remains high without any signs of abatement, and without the least hesitation if the patient has been addicted to large doses of quinine as a prophylactic measure.

Seat of Injection.—With regard to choice of the muscle for operation, I prefer the deltoid and interscapular muscles to the gluteal for many reasons; the skin over the former muscles is easily cleaned, and in African natives it takes a great deal of scrubbing to render the part thoroughly aseptic, and the difficulty is greatly enhanced should the gluteal region be selected. Moreover, the skin being tougher in that region frequently bends and bunts the needle; and lastly, in case of abscess formation, the latter situation would occasion much discomfort and inconvenience. The injection should be made deep into the muscle, and never under the skin into the loose areolar tissue, for during the reactionary stage there is a certain amount of inflammation after quinine injections which is in proportion to the extent of asepsis attained; the deep fascia forms a somewhat effective barrier against the entrance of any germs through the skin and, acting as a pad, maintains constant and equable pressure which soon hastens resolution. For a similar reason, the forearm is quite unsuitable for quinine injections, which become hypodermic and not intramuscular; the loose areolar tissue, a structure prone to inflammatory changes, should infection take place through the ducts of sebaceous glands and hair follicles, proves a frail barrier and the skin rapidly sloughs away. My favourite salt is the hydrochloride of quinine, and in "Tabloids" of 5 grs. each can easily be carried about when travelling; it freely dissolves without the aid of an acid. I, however, add a drop or two of strong HCl. to clear the solution, though it is unnecessary if the injection is made when warm, for on cooling the salt becomes precipitated if no acid is added, and may give rise to irritation. The puncture should in all cases be smeared over with vaseline, or flexile collodion applied. I prefer painting the part with liniment of iodine in view of its counter-irritant and antiseptic properties. A pad of lint soaked in absolute alcohol should be applied over the part, which exercises pressure, aids rapid absorption, and prevents the ingress of septic matter—a procedure of great importance when treating African natives, whose hygiene is not above suspicion.

Contraindications. — Quinine injections are inadvisable in all cases suffering from any ulcerative septic disease, and in very young children.

Conclusion.—In conclusion, I cannot but advocate the more extended employment of intramuscular injections in the class of cases ennumerated above, after proving the many advantages this method has a claim to, viz.: (1) Economy; (2) certainty of action; (3) rapidity of action; (4) when oral administration is not feasible; (5) and lastly, when tolerance is established from excessive doses of quinine taken as a prophylactic measure.

MEMORANDUM ON A FORM OF INITIAL LESION OFTEN DEVELOPING INTO CHRONIC ULCERS.

By F. Creighton Wellman, M.D.
Angola, West Africa.

There have come to the writer's notice in this region several varieties of ulcers, among which may be mentioned the "veldt sore," an ulcer which is probably the sloughing phagedæna which has been described from other parts of the Tropics, the so-called "malarial" ulcer (named thus principally because it as a rule heals rapidly under the local application of quinine), and another more indolent sort which forms the subject of this observation. I had noted the fact that the very frequent applicants for treatment who

came with these ulcers last mentioned generally described them as commencing in the shape of a blister "which came of itself." And some time ago a Bantu boy, whose sister had one of the ulcers under discussion on her leg, came to the dispensary with a large bleb on his cheek, another smaller one on the elbow, and a third on the inner surface of the leg just above the ankle. The natives who were about all assured me that these blebs were the initial lesions from whence "chronic sore" originated, saying that the ulcers follow only when the blisters appear on the lower limbs. I persuaded the boy to remain without treatment, and in a few days the vesicles on the face and arm had disappeared (the one on the face, which I punctured for the purpose of examining its contained fluid, being the first to go), while the one on the leg had resulted in a small area of inflammation, the central portion of which was covered with a crust composed of inspissated serum, dirt, &c. On removing this crust a shallow ulcer was revealed which looked like other "chronic sores" which I had seen in their early stage. The boy now refused to remain any longer without being treated, so the sore was swabbed with pure carbolic and an antiseptic dressing applied. It was healed at the end of a week. Fluid from the large bleb on the cheek (which was rather larger than a shilling piece) was seen under the microscope to be swarming with bacteria, which, on being sown in culture media, proved to be staphylococci.

TABES MESENTERICA AND CEYLON SOREMOUTH AND DIARRHŒA.[1]

The Differential Diagnosis and Treatment; Complications and their Treatment and Results.

By William A. Wijeyesakere, M.R.C.S.Eng.
District Medical Officer, Ramboda.

On January 20th, 1900, I read a paper before your Association on the "Etiology and Causation of Ceylon Soremouth and Diarrhœa."

Subsequently, on November 27th, 1903, I read a paper identifying the disease as tabes mesenterica, and now I come before you for the third time to prove that the remedies that I prescribe for the disease are efficacious.

Before doing so I will attempt here to differentiate the disease from those that are identical in appearance with it.

Dysentery.

In dysentery the invasion of the disease is sudden and preceded by rigors. The desire to go to stool is intense. There is great thirst, the defæcation is attended with tormina and tenesmus, and the dejections are largely mixed with blood. The presence of Kruse's bacillus in the motions is, of course, a sure test of dysentery.

In tabes mesenterica the invasion of the disease is subtle and slow. Thirst, tormina and tenesmus are absent. Blood is passed separately from the motions.

Malarial Cachexia.

In so-called malarial cachexia there is frequent recurrence of ague, and further, there is the striking feature of the enlarged spleen or *ague-cake*. The skin has a saffron-yellow or lemon tint.

In tabes mesenterica the above symptoms are absent, and there is loss of pigment from the skin.

Ankylostomiasis.

There is no doubt that nearly every bare-footed person in the Tropics harbours ankylostoma in the bowels from infancy. Professor Loos's recent researches on ankylostomiasis have proved that the larvæ are capable of entering the human system through the unbroken skin. The presence of this worm lowers the general resisting power of the organism, by disturbing the normal course of metabolism, and thereby the subject becomes more susceptible to tubercular infection.

The patient suffering from tabes mesenterica can be differentiated from this and other allied diseases by the bacteriological examination of the urine for the presence of the tubercle bacillus, or by the inoculation of tuberculin for the reactionary fever, or by the serum agglutination test for tubercle bacillus.

Treatment.

The first object in view in the treatment of a patient suffering from this disease is to cure the diarrhœa, if possible, or to control it to the least number of motions by the administration of drugs and by regulating the diet. To attain this result I have, for several years, tried various drugs, such as tinct. iodi, tinct. guaiaci, guaiacol, liq. hydrargyri perchloridi, creasote and carbolic acid. During the last three years I have only used carbolic acid pure, and find it the most efficacious and the cheapest drug. The patients take it without complaint for any length of time, in the form of the following prescription:—

℞ Carbolic acid		♏xxxii.
Tinct. chloroform co.		ʒi.
,, card. co.		ʒi.
,, Aurantii		ʒss.
Aqua ad		ʒxxxii.

All the patients admitted into the hospital suffering from this disease are in a very low state of vitality, as indicated by the swollen feet and the dilated condition of the right side of the heart. For these symptoms I use a daily hypodermic injection from the day of admission, of liq. strychnin. ♏v. for adults, and a less quantity in the case of children. These injections may be continued without producing any evil effects for even three months. So far as I have observed, strychnine does not cause increased peristalsis of the bowels and so increase their action. As soon as the patient begins to pass only one or two formed motions a day, while still continuing the above-mentioned remedies, I direct my attention to curing the secondary anæmia that these patients invariably suffer from, by the administration of Blaud's pills. I give one pill at bedtime, and increase by one daily till the number reaches eighteen; then I reduce by one daily, till the number is reduced to one again, and finally I discontinue them altogether. Then I submit the urine

[1] Read before the British Medical Association, Ceylon Branch, on March 10th, 1905.

again for bacteriological investigation, and if the tubercle bacillus is still present the above treatment should be repeated. The following is the prescription of the Blaud's pill I administer :—

℞ Ferri Sulph. ... ... grs. xxv.
Pot. bicarb. ... ... ʒss.
Pulv. Tragacanth. ... ... q. s.
Misce fiat pil. 18.

During the whole course of this treatment the patient is confined to a milk diet, consisting of :—

Milk	... 30 ozs.	Tea	... ½ oz.
Sugar	... 3 ozs.	Bread	... 8 ozs.

for the twenty-four hours. On the fifth or sixth day of this treatment the patients complain of insufficiency of food, otherwise there is no trouble with them ; they generally submit to it without grumbling.

Complications and their Treatment.

Erysipelatous swellings of the legs and feet are a frequent complication. If this extends to the thighs, it is an indication that the case is hopeless. If any of the patients in the hospital show the least indication of swelling in the feet, or are admitted with swollen feet, the repeated application of the following pigment to the swellings will successfully arrest the progress of this often fatal complication.

℞ Acid tannic ... ... ʒii.
Camphoræ ... ... ʒss.
Spt. ætheris ... ... ʒi.
Misce fiat pigment.
To be applied externally when necessary.

Sometimes the swelling abates in all parts, but persists in the feet for a considerable time, and in these cases it is necessary to supplement the patient's diet with the addition of a little stimulant, a fresh egg daily, and half a pound of raw meat twice a week. The raw meat should be minced, mixed with a dash of salt and pepper, and be given to the patient. With a very few exceptions they take it without grumbling.

Recrudescence of the diarrhœa takes place sometimes while the patient is taking his course of Blaud's pills, if the weather is very wet. This can be avoided by keeping the patient warmly clad, and allowing him a blanket at night ; there is no necessity to alter or discontinue the treatment he is undergoing, or to change the diet.

When the tubercular process becomes general and reaches the bladder, the external genitalia become suddenly swollen, accompanied with irritability of the bladder. The repeated application of the above-mentioned ether pigment to the swollen parts, after fomentation with hot water over the bladder, causes the symptoms to subside. On no account should the parts be incised with the object of relieving the swelling. I have seen disastrous results follow the adoption of such a procedure in a hospital not far from Colombo.

Ulcerations of the cornea are, as a rule, never developed among the patients in the hospital admitted without them. But they are often admitted with them. They can be successfully treated by quickly brushing the cornea with a soft camel's hair brush dipped in one in 20 per cent. solution of argenti nitratis, then washing off the nitrate of silver solution with a 5 per cent. solution of warm boracic acid, and finally applying Pagenstecher's ointment to the eye, bandaging the eye with a pad of absorbent cotton-wool placed over the closed eyelids. I renew these dressings every fourth day till the eyes are cured.

When there is otorrhœa, due to secondary tubercular infection of the middle ear, I fill in the ear with powdered boracic acid, and apply a plug of absorbent cotton-wool to the external auditory meatus, to prevent the powder escaping. The powder being dissolved by the discharge from the middle ear, acts as a curative agent. This treatment may be adopted as often as is necessary.

Occasionally the tubercular process extends to the suprarenal capsules ; then the patient develops well-marked clinical symptoms of Addison's disease, such as the feeble action of the heart, great weakness, pigmentation of the inner sides of the cheeks, tongue, and the flexures of the joints. I have had two such cases recently under my treatment, but I adopted no special treatment in them. One patient succumbed to the disease, the other was cured by the treatment I have described.

In a few cases ankylosis of the knee-joint follows as a result of tubercular arthritis of the joint ; this can be cured by the gradual pulley and weight system of extension.

The patients who are retained in the hospital after a course of treatment, owing to their extreme emaciation, can be fattened by daily inunction of four ounces of cod liver oil, and by compelling the patient to wear the same article of clothing next to the skin while this treatment lasts.

The most fatal complication in this disease is poromenitis, or the sudden effusion of serum into the serous cavities, such as the pericardial, the pleural and the peritoneal. One must be on the constant watch for the least indication of this untoward symptom, as it can be averted by a timely application of a fly-blister to the part affected, when the patient complains of pain in the region involved. When the pericardium or pleura is affected, the pain is accompanied by a certain amount of dyspnœa. When the effusion has already taken place, the only way to treat it is by paracentesis and letting out the fluid and preventing the re-accumulation of it, by the injection of adrenalin chloride.

As a result of suppuration of the enlarged sebaceous glands of the skin, tubercular ulcers form in various parts of the bodies of these patients ; these can be successfully treated by scraping, and by the application of iodoform and glycerine, and when the ulcers are filled up with granulations, Unna's paste completes the cure.

Patients who have been discharged from the hospital after a course of treatment for tabes mesenterica have, not infrequently, been readmitted with pulmonary consumption as a result of the tubercular process extending into the lungs. The treatment of these cases I need not detail here for obvious reasons.

I have recently had under treatment in the hospital three cases of Pott's disease as the result of the invasion of the tubercular process to the vertebræ of

the spinal column. I treated these with the routine treatment mentioned in text-books, but all the three patients succumbed as a result of the formation of recent and extensive bed-sores.

When tabes mesenterica becomes chronic it is very intractable, with frequent relapses. I have re-admitted a patient for the fourth time. The only way to prevent these relapses is to advise the patient to subsist on milk, Plasmon, meat juice, meat powders, &c. As estate labourers cannot afford them, relapses and deaths among them will continue.

There is an idea commonly prevalent both among the natives of this island and the immigrant labourers that cocoanut milk and oil in the curries act as a prophylactic against all tubercular diseases. Among the Sinhalese, cocoanut milk forms a constant ingredient in their curries; the Tamils rarely use it. While the children of both these races commonly suffer from tabes mesenterica, the disease is rarely met with among the Sinhalese, after the curry and rice-eating age has arrived; among the Tamils it is met with in all ages. This circumstance lends colour to this popular idea, and is worth enquiring into.

Results..

The following are the results achieved during the last four years by adopting the treatment I have described among the patients suffering from tabes mesenterica, which I venture to say is very prevalent all over the island. The total treated, the number of deaths, and the percentage of deaths to the total treated for the last four years in the District Hospital, Ramboda.

Year	Total treated	Number of deaths.	Percentage of deaths to total treated
1901	377	81	21·48
1902	342	70	20·46
1903	322	35	10·86
1904	261	28	10·72

Histories of Cases.

I annex the histories of a few typical cases of tabes mesenterica treated by me in the District Hospital, Ramboda, and I avail myself of this opportunity to thank Professor Castellani, M.D., for the help he has afforded me in verifying the clinical diagnosis of the patients suffering from this disease by bacteriological examination of the urine for tubercle bacillus.

Case 1.—In this case the Director of the Bacteriological Institute reported the presence of tubercle bacillus in the urine on January 22nd, 1904, and the patient was discharged cured on March 10th, 1904. Up to date there are no symptoms of recurrence of the disease.

Sellai. Admitted January 18th, 1904. Malabar estate labourer. Female, age 26. Married. Complained of anæmia and swelling of the lower extremities. Ill thirty days previously, but stated that before this illness she had not suffered from anything, and declined to give her family history.

Symptoms.—Sclerotics tinged yellow. Cheeks puffy. Tongue denuded of epithelium. Tonsils sound. Chest emaciated. Visible pulsation of the jugulars. Right heart dilated, systolic bruit, with its maximum intensity at the apex of the heart. Pulse small, quick, soft. Skin warm. Abdomen puffy. Liver contracted. Spleen normal. Bowels relaxed, about four semi-feculent motions every twenty-four hours. Erysipelatous swelling of the right leg and foot. Temperature, 103° F.

Treatment.—Milk diet. Carbolic acid mixture twice daily. Hypodermic injection of liq. strychnin. ɱv., once daily, and Ether pigment applied to swollen parts twice daily.

From January 25th she began to pass formed motions once daily, after which Blaud's pills were administered. There was a return of diarrhœa from January 30th to February 2nd. Her temperature became normal on February 3rd, and she was discharged cured on March 10th.

Case 2.—In this case the urine was examined before and after treatment by Professor Castellani. In the former instance the presence of tubercle bacillus was reported; in the latter, its absence.

Nalloo. Admitted October 1st, 1904. Malabar estate labourer. Male, aged 12. Ill three weeks before admission. Family and previous history good.

Symptoms.—Dyspnœa on exertion. General weakness. Anæmic. Puffy, wax-like skin. Sebaceous glands enlarged. Sclerotics tinged yellow. Denudation of epithelium from the ocular conjunctivæ. Tongue pale, denuded of epithelium at tip. Throat relaxed. Visible pulsation of jugulars, and in the tracheal fossa. Right side of heart dilated; heart sounds accelerated. A presystolic bruit heard with its maximum intensity at the apex of the heart. Abdomen puffy and warm. About two motions in twenty-four hours.

Usual treatment and diet adopted, and the patient was discharged cured on November 6th, 1904.

Case 3.—In the two following cases a mother and child were admitted to the hospital on October 5th, 1904, and on October 14th Professor Castellani reported the presence of tubercle bacillus in the urine of both patients. The child died, but the mother recovered.

The child Poochie. Malabar estate labourer. Female, aged 10. Ill one month before admission. Father and three sisters died with similar symptoms. Had influenza four months previously.

Symptoms.—Profoundly anæmic. Chest and arms emaciated. Rest of body and lower extremities swollen. Sclerotics tinged yellow. Constant running from nostrils. Tongue white and pigmented. Sebaceous glands of the skin enlarged. Denudation of epithelium from the ocular conjunctivæ. Visible pulsation of jugulars. Right side of heart dilated. Heart sounds accentuated and diffused. Pulse small, quick, soft. Liver contracted. Abdomen warm, puffy. Scanty motions constantly passed in bedclothes, consisting of green mucus. No appetite. Temperature 99° F.

Usual diet, with the addition of 1 oz. arrack daily, and usual treatment adopted. She rallied on the 12th. Temperature became normal, and one formed motion was passed. On the 13th she became worse, and died on the 14th.

Post-mortem Examination.—Right side of heart

dilated, distended with white clots of blood. Liver contracted, and nutmeg-like in appearance. Mesenteric and retroperitoneal glands enlarged.

CASE 4.—*The mother, Carpie.* Malabar estate labourer. Female, aged 40. Ill three weeks before admission on October 5th, 1904.

Symptoms.—Dyspnœa on exertion. General weakness. Bloated appearance. Profound anæmia. Sebaceous glands of skin enlarged. Sclerotics tinged yellow. Denudation of epithelium from the ocular conjunctivæ. Tongue coated with betel juice. Visible pulsation of jugulars. Right side of heart dilated; hæmic bruit, with its maximum intensity heard at the apex of heart. Heart sounds feeble. Pulse soft and quick. Passed about five semi-feculent motions in twenty-four hours. Appetite good. Temperature normal.

The usual diet and remedies were administered, and she made an uninterrupted recovery, and was discharged cured, November 12th, 1904. She has been under observation since, and up to date there is no recurrence of the disease.

CASE 5.—In this case the presence of tubercle bacillus was reported by Professor Castellani on October 18th, 1904.

Amirthan. Malabar estate labourer. Female, aged 25. Ill for some time before admission on October 9th, 1904. Married. Had five children; four died from diarrhœa. Youngest said to be suffering from the same disease on the estate.

Symptoms.—Hair falling off. Skin of scalp desquamating. Skin waxy. Sebaceous glands enlarged. Sclerotics tinged yellow. Denudation of epithelium from the ocular conjunctivæ. Angles of mouth sore, unable to open mouth properly. Breath foul. Tongue small, denuded of epithelium. Chest emaciated. Heart sounds feeble. Pulse small and feeble. Abdomen retracted. Liver contracted. Had not menstruated for five years. Appetite impaired. Had about twelve motions, consisting of blood and mucus, in twenty-four hours. Complained of tormina and tenesmus, but not thirst. Temperature normal.

Usual treatment and diet adopted.

On October 10th lower eyelids became swollen. On the 20th complained of pain in the throat due to ulceration. On the 29th complained of severe pain in the liver; application of a fly blister gave relief. From November 4th passed only one formed motion a day. On November 11th complained of severe earache and a watery discharge from both ears. Powdered boracic acid and cotton-wool were applied. On November 18th, at 4 a.m., expired suddenly.

Post-mortem examination six hours later. Rigor mortis present. Half an ounce of clear serum in the pericardial cavity. A few white clots of blood in the right ventricle of heart. Liver contracted and fatty. Kidneys slightly congested. Mesenteric and retroperitoneal glands enlarged. Mucous membrane of small intestine atrophied. Scars of healed ulcers all along small and large intestines. Depositions of miliary tubercles on the dura mater, covering both the tempero-sphenoidal lobes of the brain, which had also extended slightly to the dura mater, covering the base of the frontal lobes of the brain. The right lateral sinus of the dura mater was entirely occupied by a partially discoloured clot of blood.

CASE 6.—In this case the presence of tubercle bacillus in the urine was detected by Professor Castellani on November 8th, 1904, and after forty-nine days' treatment the bacillus was reported absent.

Sinnamma. Malabar estate labourer. Female, aged 12. Admitted November 4th, 1904. Ill one week previously. She had been discharged from the hospital on September 6th, 1904, after being cured of continued fever. Family history good.

Symptoms.—Hair covered with nits. Skin waxy-looking. Sebaceous glands enlarged. Sclerotics tinged yellow. Denudation of epithelium from the ocular conjunctivæ. Constant running from nostrils. Tongue furred, yellow at base, and teeth indented; tip cracked and denuded of epithelium. Throat relaxed. Tonsils enlarged. Chest emaciated. Heart sounds accelerated. Right side of heart dilated. Pulse small, quick, soft. Abdomen retracted. Liver dulness diminished. Spleen normal. Bowels constipated. Legs and feet swollen, especially at the right side; their skin red and tender; complained of much pain in them. Temperature 104° F. Appetite good.

Usual treatment adopted, with the addition of 5 grs. of quinine at bedtime. Usual diet, with the addition of 2 ozs. of arrack daily. Blaud's pills given from the 5th inst. Temperature normal from the 9th inst., so the quinine powders stopped. Swelling in the feet disappeared on the 10th inst. On December 14th, according to Professor Castellani's report, the tubercle bacillus was still present. I then stopped the carbolic mixture, and administered mist. creasoti, 1 oz. twice daily after meals, and on December 21st the absence of the tubercle bacillus was reported, and she was discharged, cured.

CASE 7.—This case was admitted to the hospital on November 18th, 1904, and on the 22nd Professor Castellani reported the presence of tubercle bacillus in the urine. On December 29th, after forty days' treatment, he reported the absence of the bacillus.

Menachie. Tamil pauper. Female, aged 10. Ill three months previous to admission. Her mother, three brothers, and two sisters died of diarrhœa, or of symptoms similar to hers. Two years ago she suffered from fever and headache for two weeks.

Symptoms. — Extremely emaciated. Profoundly anæmic. Skin waxy-looking. Sebaceous glands enlarged. Furfuraceous desquamation of the skin. Sclerotics tinged yellow. Denudation of epithelium from the ocular conjunctivæ. Tongue white. Throat and tonsils normal. Heart sounds feeble, right side dilated. Pulse small, quick, soft. Lungs normal. Liver and spleen dulness normal. Bowels constipated. Feet swollen. Appetite good.

Usual diet and treatment were adopted, and she made an uninterrupted recovery.

CASE 8.—This case was admitted on November 22nd, 1904, and the presence of tubercle bacillus in the urine was reported by Professor Castellani on the 25th inst., and its absence on January 7th, 1905, after forty days of treatment.

Ponnamma. Malabar estate labourer. Female, aged 27. Married. Ill one month before admission. Complained of general weakness and lower extremities being swollen. Family and previous history good.

Symptoms.—Profound anæmia. Skin waxy. Sebaceous glands enlarged. Sclerotics tinged yellow. Denudation of epithelium from the ocular conjunctivæ. Dried crusts of discharge in nostrils. Tongue coated with betel juice. Throat and tonsils normal. Heart sounds accelerated. Pulse small, quick, soft. Lungs normal. Liver dulness diminished. Spleen normal. Abdomen retracted. Bowels moved twice in twenty-four hours. Motions semi-feculent and fermented. Feet swollen. Appetite precarious. Has not menstruated for the last one and a half years.

Usual diet and treatment adopted, and she made an uninterrupted recovery.

Case 9.—This case was admitted on November 23rd, 1904, and the presence of tubercle bacillus in the urine was reported by Professor Castellani on December 7th, and its absence on January 7th, 1905, after forty days' treatment.

Sinnamma. Malabar estate labourer. Female, aged 30. Married. Complained of fever, dyspnœa on exertion, and swelling of the feet. Previous history good. Youngest child died of anæmia at 5 years of age.

Symptoms.—Anæmic and emaciated. Sebaceous glands enlarged. Sclerotics tinged yellow. Denudation of epithelium from the ocular conjunctivæ. Face puffy. Running from the nostrils. Tongue coated with betel juice. Throat relaxed. Tonsils sound. Lungs sound. Heart sounds accelerated. Pulse small, quick, soft. Suffers from useless dry cough. Liver and spleen normal. Legs and feet swollen. Two semi-feculent motions in twenty-four hours. Has not menstruated for the last six months. Appetite good. Temperature ranged from 101° F. to 99° F. till November 28th, for which quinine sulph. grs. v. were given at 2 p.m. daily.

Usual diet and treatment adopted; she made an uninterrupted recovery.

"Arch. des Sciences Biol.," St. Petersburg, vol. x., No. 5, 1904.

Mixed Infection with Plague Bacilli and Pneumococci.—Goss has ascertained that in mixed culture, on broth or agar, plague bacilli and pneumococci develop readily. In guinea-pigs and rats both organisms grow independently; the pneumococcal infection having a shorter incubation period obscures the subsequent signs and symptoms of plague infection. In mixed cultures the pneumococcus grows the more rapidly and generates acid substances, which at first delays the development of the plague bacillus. In broth faintly alkaline to litmus the pneumococcus retains its virulence for a longer period than in pure culture, due, no doubt, to the alkalinity produced by the plague bacillus. In old cultures, owing to the excess of alkalies, the pneumococci die out. In mixed cultures the plague bacillus does not lose its virulence.

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THE

Journal of Tropical Medicine

APRIL 15, 1905.

BRITISH MEDICAL ASSOCIATION.

Seventy-third Annual Meeting, Leicester, July 24, 25, 26, 27 *and* 28, 1905.

Section M.—TROPICAL DISEASES.

President: RUBERT WM. BOYCE, M.B., F.R.S., Liverpool.

Vice-Presidents: ANDREW DUNCAN, M.D., London; FLEMING MANT SANDWITH, M.D., London.

DEAR SIR,—It is hoped that the Section on Tropical Diseases at the forthcoming meeting of the British Medical Association will be well attended, and that all those interested in this branch of medicine will endeavour to be present and will unite to make the meeting successful, both by taking part in the discussions and by contributing papers.

The following subjects have been selected for discussion:—

Wednesday, July 26.—"Tick Fever."

Thursday, July 27.—"Sprue and Hill Diarrhœa."

Friday, July 28.—"Tropical Diseases of the Skin."

The Section will meet at 10 o'clock on each day.

The following gentlemen have already promised to take part in the discussions or to contribute papers: Dr. H. E. Annett, Professor Rubert Boyce, Dr. Anton Breinl, Mr. James Cantlie, S. R. Christophers, M.B., I.M.S., Dr. Andrew Duncan, Dr. J. E. Dutton, Sir Patrick Manson, Dr. W. T. Prout, Professor Ronald Ross, Dr. L. W. Sambon, Dr. F. M. Sandwith, Dr. J. W. W. Stephens, Dr. Wolferstan Thomas, Dr. T. L. Todd.

We shall be obliged if you will let us know at your earliest convenience if you will be able to take part in any of the above discussions, or if you propose to contribute a paper on some subject.

Papers bearing on the discussion, or otherwise, will be read for gentlemen unable to be in England for the meeting.

The Secretaries will be glad to receive pathological specimens, drawings, photographs, and microscopical preparations for exhibition at the meeting.

We are, dear sir, your obedient servants,

G. A. Clarkson, F.R.C.S.,
11, Southgates, Leicester,

J. M. H. MacLeod, M.D.,
11, Harley Street, London,
Hon. Secs.

"Arch. des Sciences Biol.," St. Petersburg, vol. x., No. 4, 1904.

The Hæmolysins of Plague Toxin.

Bielonovsky states that cultures of plague in ordinary media have a disintegrating effect upon the blood of healthy animals. Filtrates of plague cultures have increasing hæmolytic power up to the fourteenth day, then diminish, but never quite disappear. The plague hæmolysins are markedly resistant in heat; their intensity is in direct ratio to the virulence of the cultures; different strains of plague bacilli yield toxins possessed of different hæmolytic power.

ORNITHODOROS SAVIGNYI, VAR. CÆCUM.

The tick forwarded by Dr. Creighton Wellman from Angola, West Africa, along with his paper upon a case of relapsing fever, with remarks on its occurrence in the Tropics and its relations to "tick fever," which appeared in this Journal of April 1st, 1905, was sent to Professor Ray Lankester for identification.

We are favoured by the subjoined communication concerning the tick through the courtesy of Professor Ray Lankester, to whom we are sincerely indebted.

ORNITHODOROS SAVIGNYI, VAR. *CÆCUS*.

Argas Savignyi, Audouin, Description de l'Egypte, Hist. Nat. i., pl. ix., fig. 5, expl. plates, p. 183, 1826.

Ornithodoros Savignyi, Neumann, Mém. Soc. Zool., France, ix., p. 26, 1896 (ubi synon).

O. Savignyi, var. *cæcus*, Neumann, *op. cit.* xiv., p. 256, 1901.

The specimen examined appears to agree with the descriptions given by Neumann quoted above, and it is identical with specimens in the Museum collection labelled *Ornithodoros moubata* (Murray), a species regarded by Neumann as synonymous with the present. I cannot discover any trace of eyes. Neumann remarks that his var. *cæcus* "paraît bien plus commune que le type, pourvu d'yeux." He records it from Angola and from many other African localities, from Egypt to the Transvaal.

W. T. Calman.

British Museum Natural History Department, April 14*th*, 1905.

Correspondence.

TO THE EDITOR OF THE "JOURNAL OF TROPICAL MEDICINE."

Dear Sir,—I have just read Dr. Renner's article in the Journal of Tropical Medicine (December 15th) on "the Prevention of Malignant Disease in the Tropics," in which he asks: "Does cancer occur in natives resident in the Tropics?" I am able to answer this in the affirmative, as regards Assam, but I believe it to be very rare. During my short experience of two years there, I only saw two definite cases of malignant disease, although I had several thousands of coolies under my personal supervision.

The first case was in a Bengalee man about fifty years old, who had an undoubted epithelioma of the lip. When I saw him the disease involved three-quarters of the lower lip, half the lower jaw, and the best part of the floor of the mouth. There were also masses of affected glands in the neck and supraclavicular region. He was hardly able to open his mouth, and could only take liquid food. He died a month after I saw him, operation, of course, having been impossible.

The second case was that of a Central Province coolie woman who came to me suffering from epithelioma of the gum, involving the lower jaw and cervical glands. Any form of operation was refused. The disease soon involved the whole mouth, and I heard she died shortly afterwards.

I may mention that both these patients lived entirely on rice and native vegetables, with an occasional chicken.

On enquiring of other medical men in Assam, I heard of a very few cases of malignant disease amongst coolies, all of which were of the head (tongue, lips, and jaw).

A. Halliday Pollock, M.R.C.S., L.R.C.P. (Eng.).

Kurseong, D. H. Ry., India, March 2*nd*, 1905.

Translation.

ON FILARIA PERSTANS IN THE BUKOTA DISTRICT.

By Surgeon-Major Dr. Feldman.

(*Translated by Dr. T. S. Kerr.*)

Official Report.

In my first report on *F. perstans* I conjectured that bananas and banana juice played an intermediary *rôle* in the passage of *F. perstans* from blood-sucking insects to man.

On this hypothesis I carried out systematic blood examinations, which showed that the frequency of occurrence of *F. perstans* is proportional to the presence and growth of bananas. In Ostmpororo, only the natives of the Sultanates of Katreia and Vyawingi, where there are no bananas, were free from *F. perstans*.

Further prosecutions of my researches confirm this conjecture.

The intermediary of *F. perstans* is a tick (belonging to the *Arachnidæ*, Order *Acarina*, Family *Ixodida*, Genus *Argas*), which infests the huts of those dwelling in the banana plantations in great numbers.

During the day those light-shunning insects hide in the straw and reeds of the huts, in holes, in wood and in the hay-covered floors, only coming out occasionally, attracted by the warmth of the fire.

At night they attack man and suck his blood. After sucking they release their hold and at dawn again seek their hiding places.

The ticks are of a yellow-brown or dirty grey-brown colour, they have a tolerably hard outer case, broader posteriorly and indented at the edges. The outer case, both in furrows and ridges, shows regular markings which, under the microscope, are seen to consist of small greyish white points. On the under surface of the thorax are the two mandibles provided with hooks, and between them a powerful biting proboscis.

They have no eyes.

The powerful four-paired legs are provided at their extremities with two-hooked claws.

The pregnant female, full of blood, measures about 15 mm. long and 11 mm. broad. The male is considerably smaller.

These ticks are parasitic almost exclusively to man and only occasionally visit animals.

They constitute a positive plague and occasionally induce even the indolent natives to burn down and rebuild their huts.

They are chiefly to be found in Kimoani and Ihangiro, where, as already mentioned, the majority of the natives are infected with *F. perstans*.

The ticks suck up with the blood of natives infected with *F. perstans* the embryos of those filariæ which then pass into the stomach.

From the stomach the embryos migrate into the thoracic muscles of the tick, and after wandering about in their early stages in their host finally arrive in the ovary, where they develop into a long worm.

These worms, which are the larval forms of the adult, are deposited with the eggs of the tick in slightly decayed, ripe, broken bananas.

The result of my research on this subject may be summed up thus:—

I.—Ticks which had sucked the blood of natives infected with *F. perstans* were for twenty-five days thereafter examined daily for the presence of larval forms of *F. perstans*.

An hour after sucking, embryos of *F. perstans* were present in the proboscis and stomach of the ticks.

About the sixth day small worms appeared in the thoracic muscles, which in the succeeding days grew larger.

On the tenth day they appear as bright, shining, faintly granular tubes, about 2 mm. long. Gradually the head end thickens and the commencement of an alimentary canal is faintly recognisable.

About the fourteenth day is seen a worm possessing a bright, shining, faintly granular outline, an inner fuchsin-staining muscular layer, the commencement of a digestive system, and a further differentiation of the head end.

During the next few days, though the growth of the worm is slow, there is rapid development of the digestive system and differentiation of the head end.

About the twentieth day the worm is complete, possessing a distinct covering, a digestive tract, an inner layer, and provided at its conical rounded and thickened head end with a circular mouth.

At this stage of development the filariæ migrate from the thoracic muscles to the ovary of the tick.

A tongue next appears in the head end of the worm.

After the twenty-second day the worm lengthens greatly, in quite a short time increasing from four to five times its own length.

At this stage of development there is a thickened head end with a rounded mouth and protractile tongue, representing a boring apparatus; a digestive tract, extending from the mouth to the cloaca in front of the tail end, and a double-lobed tail.

On attaining this stage of development the larval form of *F. perstans* in the tick is complete.

II.—In slightly decayed ripe bananas taken from the huts of natives I found a mass of tick eggs, and amongst them recognised the large larval form of *F. perstans* already described.

The same result was obtained by microscopical examination of the centrifuged sediment of fresh banana juice obtained by squeezing up the slightly decayed bananas with added water, which constitutes the usual drink of the country.

An opportunity of depositing their eggs in bananas is afforded to ticks, as it is the custom for natives to hang the unripe plucked banana bunches in their huts until ripe.

III.—Ticks which had sucked the blood of natives infected with *F. perstans* were afforded the opportunity of depositing their eggs in ripe entire bananas, but search in these for tick eggs and larval forms of the *F. perstans* proved negative. The parts of the banana skins on which tick eggs were found deposited I have investigated in smear preparations for tick eggs and larval forms of *F. perstans*. The research gave positive results. My research already described gives shortly the following results:—

Embryos of *F. perstans* are conveyed with human blood into the species of tick described and develop in these ticks into the larval form of the adult.

These larval forms are deposited by the tick with her eggs in decayed ripe bananas with broken skins and are carried with bananas or banana juice into the alimentary tract of man.

After wandering about the intestine they probably bore their way through and find their way into the tissues of the abdominal cavity, where they develop into the adult form.

Remarks by Dr. T. S. Kerr.

The official report of Dr. Feldman, Surgeon-Major to the Imperial forces in German East Africa, on *F. perstans* in the Province of Bukota, in the February number of the *Archiv. für Schiff-und Tropen-Hygiene*, a translation of which appears in the current number of this journal, is a serious contribution to the literature of this important subject.

In a former paper (the July number for 1904 of the same journal) Dr. Feldman, after an elaborate research on some 6,000 natives in various provinces of the district, a study of the minute anatomy of both embryos and parental forms of *F. perstans*, of the physical features prevailing in these districts, comes to the conclusion that the occurrence of *F. perstans* is in some way connected with and proportional to banana cultivation, an opinion, by the way, already expressed by Christy.

He gives a table, showing in nine districts the number of natives examined in each of these districts, and the percentage infected with *F. perstans*.

In eight of these districts banana cultivation is carried on and a large proportion of the inhabitants are infected with *F. perstans*. In the ninth district, M'pororo, comprising the three Sultanates of Kisselewombo, Katreia and Myawingi, 300 natives were examined; in the two latter, where there are no bananas, 200 were examined, none of whom were infected with *F. perstans;* in the former, where bananas are but sparingly cultivated, other conditions being the same, the numbers infected were proportionately few.

This table is adduced in proof of his contention.

Dr. Feldman, after further prosecution of his researches, now asserts in his later paper that the intermediary of *F. perstans* is a tick, and that during a developmental stage in their passage through the tick's body these larval forms of *F. perstans* find their way into the ovary and are deposited with the ova in broken, decaying ripe bananas.

The usual drink of the natives being made from these decaying ripe bananas, an opportunity is afforded the larval form of *F. perstans* of readily gaining access to the alimentary canal of their human host, whence they bore their way into his tissues.

He describes the developmental changes of the embryo in its passage through the tick and how he found the larval forms lying together with tick eggs in broken, decaying ripe bananas.

Suggestive as Dr. Feldman's paper is, there are, perhaps, one or two points which seem to us to require elucidation before it can be accepted as proving what he claims for it.

In Dr. Feldman's paper it is nowhere stated what measures he adopted to ascertain if the ticks in which he subsequently found larval forms were uninfected before feeding on beings infected with *F. perstans*.

It would, further, be interesting to know if (1) the ticks which were subsequently dissected after feeding on infected natives were specially selected ticks reared from the egg or simply ticks known to have fed on those infected with *F. perstans*. (2) If the eggs with the small worms found lying amongst them were ascertained to have been deposited by selected ticks. (3) Whether any control experiments were made with ticks that had sucked the blood of those uninfected with *F. perstans*, and their results.

In view of the theory put forward, how account for: (1) The prevalence of *F. perstans* (about 70 per cent.) amongst Indians living in forest in the back country of British Guiana, where bananas are not cultivated. (2) Its complete absence in many of the West Indian Islands, where the banana is extensively cultivated; also in the Malay Archipelago, the Pacific Islands and the basin of the Zambesi.

These are difficulties that occur to us without denying the accuracy of Dr. Feldman's observations, and before accepting them we should like to have these difficulties explained.

The illustrations accompanying his paper are somewhat crude, and without absolutely dissenting from Dr. Feldman's views, we confess we should have liked to have seen the evidence in greater detail and more elaborately and carefully illustrated.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the Journal of Tropical Medicine *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Indian Medical Gazette," March, 1905.

1. Some Points Connected with Liver Abscess as Seen in Calcutta. By J. W. D. Megaw, Captain I.M.S.
2. Vaccine Lymphs in the Punjab. By W. F. Harvey, Captain I.M.S.
3. The Nature and Prophylaxis of the Fevers in the Dinajpur District. By Leonard Rogers, Captain I.M.S.
4. An Outbreak of True Beri-beri among the Students at Tura, Garo Hills, Assam. By the Rev. G. C. Crozier, M.D.
5. Myxœdema in India. Letter. H. Hamilton, Colonel I.M.S.
6. Thirteen Cases of Cholera Treated with Oil Eucalyptus. Letter. H. Banerji.

(1) Megaw reviews the cases of liver abscess which have been treated in the Medical College Hospital, Calcutta, from the year 1895 until the commencement of 1905. Of the 292 cases dealt with during that period nearly 50 per cent. died, in spite of the

promptest surgical treatment; or, including the probable deaths amongst some of the thirty-four patients who left the hospital at their request, the mortality may be stated to be almost 60 per cent.

Of 224 records a history of dysentery was found in 150 only, so that the clinical evidence of the influence of dysentery is not very convincing. If, however, the clinical and *post-mortem* records are taken together, there is evidence of dysentery in almost 90 per cent. of the cases. Of sixty-four consecutive *post-mortem* examinations of cases of dysentery, in seven definite early liver abscess were met with, while in many others the liver appeared in the early stages of "fatty" or "cirrhotic" degeneration, and in only a few could the liver be said to be healthy.

The proportion of liver abscesses amongst the natives of Bengal is large compared with the almost complete immunity enjoyed by the Sepoys (native soldiers), the difference being in all probability due to the temperate habits of the Sepoys both in food and drink. According to Capt. Megaw, alcohol would seem to be a markedly determining factor in the etiology of liver abscess, a history of spirit drinking in some form being ascertained in 70 per cent. of the cases. *Age:* Statistics show that liver abscess is a disease of early manhood; it is rare in youth and old age, and not seen in childhood. *Sex:* Of 278 cases only ten were females (seven Hindus, two Europeans, one Mahomedan). Malaria does not seem to play a special part in causing liver abscess.

The situation of the pus, according to fifty available *post-mortem* records, was as follows:—

Single large abscesses (right lobe) ...	20
Single large abscesses with one or more smaller	7
Single large abscesses with numerous small	11
Multiple fairly large abscesses	3
Numerous small abscesses	3
Perihepatic single abscesses	4
Perihepatic abscesses with secondary smaller	2

The abscess had burst into:—

(*a*) The right pleura	in	3 cases.
(*b*) The right lung	,,	2 ,,
(*c*) The peritoneum	,,	2 ,,
(*d*) The inferior vena cava ...	,,	1 case

In six cases there were secondary abscesses in the right lung without any visible communication with the abscess cavity in the liver.

(2) Harvey, in his report to the Sanitary Commissioner of the Punjab, advocates the advantages to be derived from the use of glycerinated lymph in comparison with vaselinated vaccine lymph.

The glycerinated lymph was subjected to treatment by chloroform with excellent results. The method is as follows: The lymph pulp is ground up and mixed with sterile water. Chloroform vapour is then passed through the mixture at a uniform rate for three to six hours, when it is stopped and filtered air is passed through in order to displace the chloroform. All extraneous organisms will be found thereby to be destroyed, but spore-bearing forms remain and micrococci are sometimes left alive; nevertheless, the treatment by chloroform is a great saving in time, and corresponds to the good effected by glycerine in a month. Harvey summarises the results of his experience as follows:—

Glycerinated Lymph.

(*a*) Prolonged contact with glycerine results in destruction of vaccine virus, but means can be taken to minimise this action by regulation of temperature.

(*b*) Contains when ready for issue few or no extraneous micro-organisms and those which are present are restrained from multiplying.

(*c*) Gives uniform results owing to thorough admixture.

(*d*) Can be subjected to the chloroform process, and so become available for use at any period after preparation.

(*e*) Little or no liability to produce inflammation (so-called "strong lymph").

(*f*) Duration of activity at a low temperature not less than three months in the case of a good quality lymph.

(*g*) Liability to deteriorate from the effect of heat, less than "pure" undiluted lymph.

Vaselinated Lymph.

If lymph contained *no* extraneous organisms, prolonged contact with vaseline might be presumed to be without danger of destruction to the vaccine virus when kept at a low temperature.

Contains innumerable extraneous organisms when issued, and these are in no way restrained from multiplying.

Liable to give unequal results owing to difficulty of admixture.

Cannot be subjected to the chloroform process.

Liable to give rise to inflammation and ulceration.

No superiority in duration of activity.

Liability to deteriorate from the effect of heat less than "pure" undiluted lymph, but greater than glycerinated lymph.

Recommendations.

Harvey recommends—

(*a*) That glycerinated lymph should be substituted for vaselinated lymph in the Punjab.

(*b*) That the glycerinated lymph should first be treated with chloroform.

(*c*) That a central lymph depôt should be established in Lahore, from which lymph could be supplied to the districts of the Punjab.

(*d*) That all vaccinators should undergo a course of training at the Central Depôt.

(3) Rogers, in Part II. of a report upon this subject, states that of the kinds of malaria met with in the Dinajpur district malignant tertian was by far the most common; one case of benign tertian was noticed, and quartan parasites were also met with. During the enquiry, Rogers, in thirty cases of fever with splenic enlargement, performed spleen puncture and found in one-third of the cases the Leishman-Donovan body; but in no less than half the cases examined neither malarial parasites nor the new bodies could be

found even by splenic puncture. Clinically, it is impossible at present to differentiate between the symptoms presented by patients suffering from the Leishman-Donovan bodies and those infected by malaria, in which the malignant tertian parasites are met with. In kala-azar Bentley proved the presence of the Leishman-Donovan bodies, and as this disease is undistinguishable from malarial cachexia it is reasonable to conclude that similar infections obtain in the several forms. The *Anopheles* mosquitoes found in the houses in Dinajpur town were in the following proportions: *A. fuliginosus*, 178; *A. rossii*, 39; *A. listoni*, 6; *A. barbirostris*, 3; *A. sinensis*, 2. Mosquito destruction by improving the drains and removing stagnant water, &c., will no doubt check malaria in towns, but in the rural districts some other form of mosquito destruction must be relied upon. This can only be done by efficient doses of quinine.

(4) Dr. Crozier describes an outbreak of beri-beri at Tura, in Assam. It would appear that persons dwelling in the neighbourhood of the institution from which he writes suffered from a disease closely resembling the ailment the native students were attacked by. A description of eighteen cases is given, and while some appeared scarcely typical forms of the complaint, the majority afforded examples of signs and symptoms indistinguishable from beri-beri. The outbreak was first noticed in May, 1904.

(5) Hamilton saw a case of myxœdema at Meerut in 1895. The man recovered after being given half a thyroid gland of a sheep or goat daily for a month.

(6) Banerji administered in thirteen cases of cholera the oil of eucalyptus with mucilage and syrup, with dilute hydrocyanic acid and subnitrate of bismuth. The treatment seemed to answer well.

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1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the JOURNAL OF TROPICAL MEDICINE should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communications.

THE INCIDENCE OF DISEASE IN HONG KONG.

By William Hunter, M.B., C.M.Aberd.
Government Bacteriologist, Hong Kong.

The spread of disease over the surface of the earth is, curiously enough, a science of recent origin. In fact, it may be regarded as yet in its infancy.

However, looking at the question broadly, one is at once compelled to admit that this question is one of enormous magnitude and importance as regards geographical pathology.

Indeed, it would seem a wonder why medical England so slowly awakened to her splendid position of possessing the ways and means of establishing for her great colonial empire a knowledge of the diseases met with in various British climes and countries, and of the best means of dealing with them.

The credit of awakening Britain to her responsible position in leading the van as regards colonial hygiene belongs to malaria. The diffusion of this disease, its terrible scourges, &c., may be said to have given the first impetus towards the study of the incidence and methods of prevention of tropical disease. It was with the hopes of removing from mankind one of the worst disease scourges that British workers took up the study of tropical disease, and the results thereof are fully confirmed by the brilliant researches of Manson, Ross and others, whose work has not only met with practical recognition in Britain, but also in other European countries.

The monumental work of Hirsch on geographical and historical pathology was probably the first successful attempt to raise the study of this branch of medicine to a science. Since then, apart from a succession of articles in various tropical publications, practically nothing has been attempted to bring the study of this science on a level with other medical sciences.

At the same time, much useful information has been obtained from the writings of Davidson, Manson and others.

A recent book, and one which follows closely in the steps of that of Hirsch, is that published by Clemow. Here one finds, in chapter after chapter, prominence given to the main facts of the geographical distribution of each disease, and statements are forthcoming as to the factors possible in the determination of that distribution.

The subject of the incidence of disease in Hong Kong has, since I arrived in the Colony, been one of extreme interest to me. I considered it of importance to note the absence as well as the prevalence of disease in a country far removed from Europe. My reason for entering upon the study of such an interesting question rests upon the fact that the incidence of disease in any particular spot of the earth's surface must throw a considerable amount of light upon some important questions in pathology.

Permanency as regards the geographical distribution of disease cannot be final. Many diseases have, so far, not reached their limits of diffusion. It would appear that, with the inroads made by civilisation, diseases, at one time confined to certain areas of the globe, are spread broadcast over the surface of the earth. The diffusion of small-pox, cholera, plague, &c., has only to be mentioned in order to emphasise this distribution of disease through the establishment of close international commercial enterprise.

Latitudinal Geographical Distribution.

Apart from the incidence of exotic disease, *e.g.*, cholera, disease would appear to have a latitudinal geographical distribution. Certain diseases are found chiefly in cool climates, others are more or less confined to the Tropics. In this respect one has only to note the incidence of different diseases in Shanghai and in Hong Kong. In the former settlement, which is out of tropical influences, the diseases prevalent are, on the whole, similar to those found in Europe.

Plague in Hong Kong.

Of all diseases prevalent in Hong Kong, *exotic plague* is that which causes most anxiety. Its outbreak in 1894 marked an epoch in the history of the disease. From Canton and the surrounding provinces—the endemic centres of the outbreak—plague has spread almost over the entire globe. Year by year Hong Kong has its epidemic of plague. It is sometimes mild, sometimes severe, but its annual recurrence is undoubted and has gradually become an expected event in the lives of Hong Kong residents. A remedy for the effectual eradication of the disease would not appear to be to hand. Indeed, it is not too rash a statement to say that it is extremely doubtful if, with our present knowledge of hygiene, we can materially influence the recurrence of plague in its endemic home. I doubt if we have yet got into touch with the methods of successfully dealing with the real root of the evil. A natural question to ask in regard to these endemic centres of plague is, will not the exotic, in defiance of the efforts of the sanitarian at immediate eradication, eventually disappear more or less suddenly and for no apparent reason? Plague epidemics in the past have suddenly disappeared from endemic centres, *e.g.*, Egypt, and Europe in the seventeenth century. How can we account for this? At the time there was no great effort made in either of these places to improve sanitation.

Cholera.

Another exotic disease which threatens the inhabitants of Hong Kong is *cholera*. According to Manson, cholera is endemic in Canton. Hence a good reason for dreading the introduction of the disease in epidemic form into the Colony. One point which, to a certain extent, insures us against the widespread prevalence of this disease in Hong Kong is that cholera is essentially a water-borne disease. It is rare for the Chinese to drink water. They prefer tea as a quencher of thirst. If water is used, it is usually boiled along with other articles of diet. This custom must be held largely responsible for the prevention of cholera in its typical manifestations amongst the residents of the Colony. Furthermore, the water supply of the city of Victoria is above suspicion.

Malaria.

The past history of Hong Kong has clearly shown it to possess excellent breeding ground for the malarial mosquito. History records Hong Kong as notorious for the prevalence of *malaria*. The configuration of the island is such as favours this condition of affairs. Ravines, shallows, &c., with pools and streamlets, abound, and there the Anopheles has every encouragement to breed prolifically. If Hong Kong had a black record in the past, it has every reason to congratulate itself at the present time. During the past decade fever of the malarial type is, to say the least, rare in the city of Victoria. It is the exception rather than the rule to hear of Europeans contracting the disease. It is true, some parts of the Colony are still malarial, and residents, *e.g.*, the police, in such districts contract the disease. In general, however, the city of Victoria must be regarded as extremely healthy from a malarial point of view. This satisfactory condition of affairs, as regards malaria, is due, in the main, to the successful efforts of the Government in training scientifically the main "nullahs" in and around the outskirts of the city.

Beri-beri.

Beri-beri may also be included as a disease common amongst the Chinese population of Hong Kong. Its incidence, however, is subject to considerable variation. Small outbreaks of epidemic beri-beri occur from time to time, and the death-rate from the disease averages between 300 and 400 per annum. There is no strong proof that the disease is endemic either in Hong Kong or in China as a whole. The disease would appear to be constantly imported from two principal centres of this disorder in the East, namely, the Malay peninsula and neighbouring archipelago, and Japan. In Hong Kong the type of the disease is chronic and benign. Acute pernicious cases of the disease, such as found in endemic centres, *e.g.*, Singapore, are rarely met with.

Dengue.

During the past year or two more or less severe epidemics of *dengue* have been prevalent in Hong Kong. In 1902 the disease was severe, almost all the Europeans contracting the infection. In 1903 and in 1904 there have been slight outbursts of the disease, but the number of persons attacked was small. Dengue fever in its epidemic spread resembles influenza. Its extensions are marked by a great irregularity. From all accounts the disease has so far been limited to the tropical belt, with extensions for a few degrees on either side of this latitude. Again, epidemics of dengue are usually found prevalent during the hotter seasons of the year.

Small-pox.

Small-pox recurs annually in Hong Kong. It makes its appearance during the colder seasons of the year. Its incidence is small amongst the resident population. This disease is one of the commonest in China, especially in the northern parts of the country. In Hong Kong, however, excluding the large number of imported cases, the disease scarcely ever assumes serious proportions.

Typhoid.

The incidence of *typhoid fever* amongst the Chinese population of Hong Kong is difficult to estimate. Europeans frequently suffer from the disease. With the Chinese, however, the information regarding the disease is meagre. Typhoid is a disease of insidious onset. The Chinese residents of Hong Kong, should they feel sick, quickly leave the Colony "for their country." Thus it becomes a matter of extreme difficulty to obtain accurate results in regard to the prevalence of enteric fever amongst the natives. We have no records of any value in the Chinese hospitals in Hong Kong. Again, the natives rarely enter a hospital but "to die." *Post-mortem* examination of hospital cases is avoided as much as possible in deference to the religious feelings of the people.

At the public mortuary, however, excellent opportunities of studying the incidence of disease are obtained. During the past year a number of cases of typhoid fever have been found by *post-mortem* examination. A detailed account of the results obtained is published in the Annual Report of the Government Bacteriologist of Hong Kong for 1904. It shows that enteric fever is by no means a rare disease amongst the Chinese. It occurs as frequently in adults as in children, and further, the theory of acquired immunity from typhoid in childhood is not supported by the evidence obtained by actual *post-mortem* examination.

Tubercle.

The Chinese would appear to be extremely susceptible to *tubercular diseases*. Throughout Hong Kong tuberculosis, in its various manifestations, is rampant. Tubercular meningitis is rare, but acute generalised tuberculosis in young children, and phthisis in young adults and the wage-earning population, are widespread, and contribute largely towards the annual mortality. Again, the course of tubercular infections amongst the natives is much more acute than that found in Europeans. At the public mortuary, where over 2,000 autopsies are held annually, types of tubercular disease are found which, in their severity and distribution throughout the body, exceed even the most pronounced cases of the disease met with in Europe.

Venereal Diseases.

The ravages caused in China through *venereal diseases* are very apparent in Hong Kong. In China no efforts are made to control these diseases, and they become a terrible scourge to all classes of the population. Indeed, for certain districts the term "generalised syphilisation" would be correct. *Post-mortem* evidence of syphilis is quite common, and gummata and various aneurisms are occasionally found.

Diarrhœa and Dysentery.

Diarrhœal disorders are extremely common in Hong-Kong. In infants and children diarrhœa accounts for a considerable annual death-rate. In adults, native or European, this symptom of so many affections is prevalent and frequently a very disturbing factor in the life of the Hong Kong resident. Amongst the Chinese

disorders of this nature abound, and are due to ordinary causes, *e.g.*, ignorance, improper feeding, unhygienic surroundings, and the like. One may truly say, after a study of the Eastern native, that the determination of the incidence of this class of disease depends upon the geographical distribution of education in the factors productive of normal physiological processes of health. *Dysentery* is also common in Hong Kong. It prevails mostly in chronic form and does not figure largely as a direct cause of death. I cannot agree with Clemow, who states that it is one of the commonest diseases under treatment at the Government Civil Hospital in Hong Kong. Cases are frequently recorded, but not in excess of other common diseases.

Respiratory Disorders.

Respiratory diseases account for 20 to 30 per cent. of the total Chinese deaths in Hong Kong. Bronchitic affections are widespread, and catarrhal and croupous pneumonia are frequently found to be the causes of death in children and adults. Amongst Europeans pneumonia is not common. Influenza is met with as at home. Complications and sequelæ would appear to be less common.

Cases of *liver abscess* are met with. Its incidence is far below that of Cochin China, where the disease accounts for nearly 4 per cent. of the mortality from all causes. In Hong Kong it is about as frequent in natives as in Europeans.

On the mainland and in Canton *leprosy* abounds, but little of the disease is seen actually in Hong Kong. The neighbouring provinces of Kwang-tung and Fokien are described as the cradle of the disease in China.

Blackwater fever is never seen in Hong Kong.

Typhus fever must be regarded as extremely rare in the Colony. It exists, however, in the neighbouring Chinese provinces.

Stone is said to be common in China. Few cases, however, reach the hospitals in Hong Kong. *Biliary calculi* are also rare.

Cerebro-spinal fever is only occasionally met with, and *measles*, *scarlet fever* and *chicken-pox* are scarcely ever in evidence, unless imported. In more northern latitudes, however, *e.g.*, in Shanghai, such diseases prevail as in Europe.

Diphtheria accounts for very few cases per annum. It is usually imported from some neighbouring seaport.

Whooping cough occurs, but the disease is milder in type than in Europe.

Rickets is one of the rarest diseases in Hong Kong. Most Chinese babies are breast fed. They live amongst filth, and many children rarely breathe pure air. The staple food of the native is rice, with bits of fish and meat, and the children as well as the adult look upon their meal hours as the events of the day. Unhygienic surroundings would not appear to be of such importance as deficient and improper food in the production of this condition.

Acute articular rheumatism is very rare in Hong Kong. Varieties of chronic rheumatism are amongst the Chinaman's greatest afflictions.

Amongst the Chinese in Hong Kong *atheroma* is general. It would appear to begin early in life. Almost every Chinese cadaver over twenty to twenty-five years of age shows marked atheroma and arteriosclerosis.

The foregoing details are simply the records of my experience of the incidence of disease in Hong Kong. It is by no means complete. Medical diseases only have been considered. The facts pertaining to the incidence of surgical and skin diseases, &c., can well be left for consideration in a separate contribution.

Again, such an account of the prevalence of different diseases in Hong Kong can have no finality. At the present day there can exist no classification of disease on a geographical basis.

I trust, however, that in the foregoing account of our diseases in Hong Kong I have given a fair representation of the incidence of these diseases and the facts bearing upon their pathology.

SPIRILLA FEVER IN SOUTH CHINA.

Short Notes of a Case.

By Leopold Hill, M.R.C.S.
Late of C.M.S. Hospital, Pakhoi.

To the two or three contributions to the Journal recently of cases of relapsing or spirilla fever I would like to add a short note of a case occurring in South China (Pakhoi). In the routine examination of the blood of many hundred fever patients there I have only twice found *Spirillum Obermeieri*. The first was recorded in the Journal[1] some time ago. The following are the notes of the second. I have not come across the notes of others having observed this disease in South China, and it would be of great interest to all readers of the Journal if others would give their experience of this fever and so help to elucidate its cause.

Case Record.

Chinese coolie, aged 33. Has been in the employ of and lived in the compound of a European for several years, in the coolie quarters. Date of admission into hospital, March 7th, 1904.

History.—Had been ill with "fever" and unable to do his work for several days; quinine had been given, with no benefit.

Condition on Admission.—Patient very weak, thin and sallow. Complained of pain in left shoulder. Temperature, 101° F. Examination of blood showed an excess of leucocytes, but no malarial parasites; myriads of spirilla in every field.

Progress.—Temperature same night, 5.30 p.m., was 103·6°. March 8th, 102·6° a.m. and 102·8° p.m. Spirilla immediately detected, but not so numerous as on previous day, the blood flow from the finger-prick very scanty. Since admission given quinine gr. iv. bis die, and phenacetin gr. vi. On March 9th the morning temperature was 99·8, and no spirilla were found on carefully examining blood. The patient is extremely feeble and jaundiced; was given digitalis and strychnine. On March 10th the temperature was subnormal, no spirilla, leucocytes greatly diminished and rare. The

[1] Journal of Tropical Medicine, February 1st, 1904.

tongue is cleaner and jaundice less. March 11th, no fever, no spirilla, blood flows easily on pricking finger. There was no further rise of temperature and no further discovery of spirilla, and the patient gained strength daily, and was discharged on March 25th.

These are the notes taken at the time when I was in China last year. Although the quinine was continued when the patient came to the hospital, I think phenacetin in this case (as in the former) did more to destroy the spirilla than anything else, and possibly brought them to the peripheral blood, making it easier to detect them after giving this drug than before. The blood should be examined immediately it is drawn, and those to be stained should be forthwith done.

NOTE ON A FORM OF MALARIAL PARASITE FOUND IN AND AROUND JERUSALEM.

By J. Cropper, M.A., M.D., B.C.,
Rumullah, Palestine.

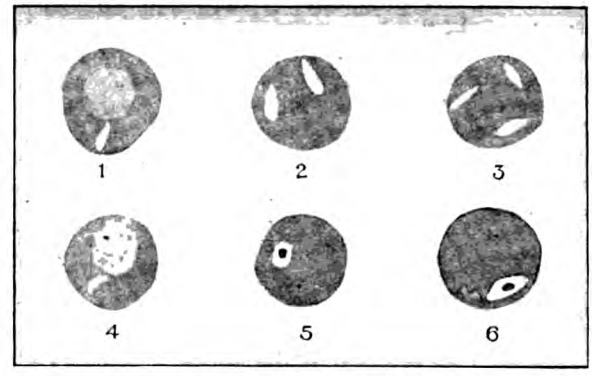
Shortly after beginning work on the malarial fevers of this district, I found that certain cases of remittent fever, and indeed the great majority of such, presented on microscopic examination of fresh films numerous parasites, which I could not reconcile with any of the figures in the books at my command, nor could I find in any but a small minority of these—*i.e.*, 10 per cent.—the "pale rings" so commonly drawn and so easily stained.

These pale rings frequently were associated with "crescents," and in three cases I was able to find the sporulating form (*i.e.*, in 1 per cent.), of which I have stained slides (*i.e.*, of peripheral blood).

Incidence, &c.—For the most part this form occurs in children, who frequently have enlarged spleens—30 per cent. at 5 years or under. They had been ill often for months with fever, generally of a quotidian type, more rarely tertian in character. Indeed, so rarely was there a tertian history that I can readily believe that all were cases of double infection, as happened in two cases, in which the tertian parasite also was found.

Pale Rings, where Found.—The cases of fever with "pale rings" come chiefly from the Jordan valley—a fever often of a very severe type; but I am convinced that we have to do with a *separate and distinct type of infection*, and this is of the greater importance, since several observers now incline to the belief that there is only one species of malignant parasite.

Minute Anatomy.—In fresh films, carefully prepared, perhaps the earliest form in which the parasite is seen is as a minute, rounded, rather refractile body near the periphery of the red cell, but the form which mostly engages attention is of an oval or short rod shape, which, when seen in a corpuscle with central vacuole forms something like the handle of a ping-pong racquet, the blade of the latter being the vacuole (fig. 1). Often, too, it appears as a pale, elliptical, or rod-shaped body lying parallel to the periphery or at a tangent (fig. 2) to the same. It may also be more or less bent or comma shaped, and (figs. 3 and 4) multiple infection is common in bad cases, and, generally speaking, the number of parasites very fairly corresponds with the gravity and duration of the disease; there being as many as fourteen or more in a field (in some cases) where the fever has been going on for months, and the spleen is notably enlarged.



In no case is the parasite seen to be affixed or stuck on to the cell, as often happens in pale rings of the tropical form.

Above all, it can easily be distinguished from any kind of vacuoles due to drying of the films (which should, of course, never be seen in a well-mounted slide properly ringed with vaseline even after some days).

Larger Forms.—As a rule, the above have no central body, but in about 12 cases I have been able to make out, in what is evidently an older form, a central dot, not pigment. Amongst these movement is comparatively common, and this movement has been watched for hours, in one case for twenty-seven hours, at intervals (fig. 5).

These older forms are of the shape of a melon seed, but flat in cross section: this appearing plainly when the movement takes the form of *rotation on its long axis* (fig. 6).

In size this form varies from $\frac{1}{4}$ to $\frac{1}{2}$ of the diameter of a red cell.

Movement.—This is very characteristic, and totally different from the amœboid, slow-flowing motion seen in cases of pale rings. The amœba does not alter its shape to any appreciable extent, but at most has a slight oscillatory character, the chief point being the alteration of the direction of its axis and of its position in the cell, which takes place fairly quickly and to a considerable extent.

After some hours this movement generally ceases. When doubly infected this movement is very easily made out.

One has, of course, to avoid mistaking the movement of a motile bacillus lying on a corpuscle for the above, in a dirty slide; but this is easy.

Pigment.—In the later stages two or three small grains of pigment may (but rarely) be observed.

Crescents I have found in 2 or 3 cases only in this infection. I have examined the blood of the spleen in only one instance. In it I have found no pigmented bodies of any kind.

In some cases marked poikilocytosis occurs, but not generally.

In about 12 cases I have found this parasite in persons who complained of little or no fever, but whom I suspected of malarial poisoning, with perhaps headache, anæmia and sallowness. Without exception these have greatly improved under quinine. As a rule the number of parasites in these was very small and they were only found after long search.

In the only case with pernicious symptoms of the tetanic type described by Marchiafava and Bignami I found six or seven of these forms five days before death. Other cases, of a comatose or bilious remittent type, have all recovered.

So far I have been unable to stain dried films, though all the other forms of the malarial parasite have stained exceedingly well by Leishman's method; the larger forms can sometimes be made out faintly. Of all forms of malaria this is most refractory to quinine, though it yields in the end. The parasite, too, corresponds with this, and can be seen days after quinine has been given in adequate doses (15 to 30 grains daily). Some of my cases have been examined at intervals of several weeks and months, a few much oftener.

As mentioned elsewhere, this form is found chiefly in the hill districts, and I believe that persons immune to it readily fall a prey to the tropical form with pale rings. Workers on the new Haifa to Damascus railway from this village frequently come back in wretched health from the Jordan valley, and with crescentic infection.

Lastly, the figures sent herewith have all been drawn from fresh or stained slides during the last six months, and not from book illustrations. The majority of the patients were very ill, and had enlarged spleens of various degrees.

N.B.—The form of parasite above described has occurred in 192 cases out of a total of 300 positive examinations; sometimes as a mixed infection, but generally alone. The youngest patient was $2\frac{1}{2}$ months, and 68 were in children under five.

Anopheles maculipennis is to be found in ALL the wells in Jerusalem, and also probably in all the villages possessing wells.

[This communication was accompanied by numerous illustrations; a few only are published.—ED. *J. T. M.*]

CONGENITAL MACRODACTYLITIS IN THE PHILIPPINES.

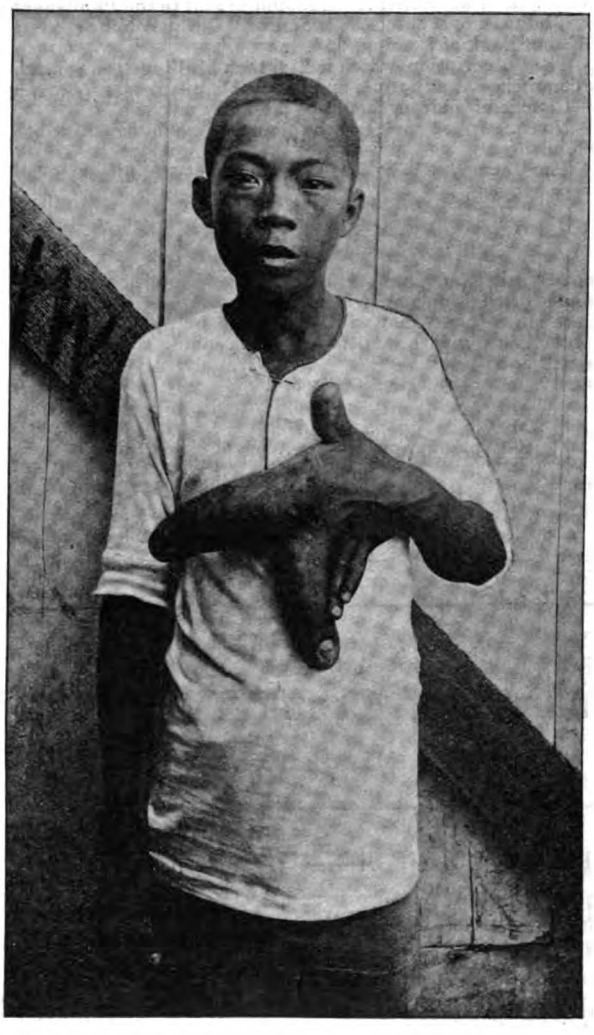
By ISAAC W. BREWER, M.D.

[THIS communication was addressed in the form of a letter to the Editors].

Fort Huachuca, Arizona, April 7th, 1905.

I enclose a photograph of a Filipino boy suffering from congenital macrodactylitis of the thumb, index and middle fingers of the left hand. At the time the photograph was taken, the spring of 1901, he was about fifteen years of age and was apparently well in every other respect. According to his mother's statement the fingers were enlarged at birth, but have increased in size very much during the last few years. He is a native of the Tagalog tribe and has always lived in the suburbs of Manila. His blood was examined for filaria, with negative result, by Dr. R. P. Strong, to whom I am indebted for the photograph.

Captain Walter D. Webb, U.S.A., in a personal communication reports a similar case which he saw with Major H. D. Snyder, U.S.A., at Tacloban, Leyte, Pacific Island. The patient was a man of forty-five years, of the Visayan tribe. In this case the fingers were affected and the disease was congenital.



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THE

Journal of Tropical Medicine

MAY 1, 1905.

THE DESTRUCTION OF MOSQUITOES.

THE article which appeared in this Journal of April 1st, upon "The Effect of Drainage and Other Measures on the Malaria of Klang, Federated Malay States," has been commented upon by Major Ronald Ross in the *Times*. The statements and arguments advanced by Major Ross are worthy of all consideration and support, and he very justly points to the results of Dr. Malcolm Watson's investigations with keen satisfaction. Urban malaria indicates an insanitary condition of any town in which the disease prevails. In a well-paved town with a good water supply and drainage appropriate to the climate, malaria, except for imported causes, should be practically unknown. Dr. Watson's investigations prove this conclusively, and his work is highly creditable not only from the practical good he has done locally, but for his contribution to the science and methods of hygiene. Another phase of this great question is dealt with by Sir Patrick Manson in a letter which appears in *The West India Committee Circular* of March 14th, 1905. His remarks are made anent an opinion advanced by Mr. C. Kenrick Gibbons that the absence of malaria in Barbados is due to the presence in the swamps and ponds of Barbados of a tiny fish which exists in such teeming numbers as to earn the name of "millions," whose staple diet is the larvæ of mosquitoes. Sir Patrick remarks that: "Without further proof, admitting it as a possibility, I would not accept it as proven that Mr. Gibbons's explanation of the absence of *Anopheles* in Barbabos is attributable to the presence of the little fishes called 'millions.'

"Some years ago the London School of Tropical Medicine sent out an expedition to study beriberi, and when the study of that subject had been completed, to study the distribution of the various species of mosquites in the Pacific Islands. As regards mosquito-borne disease these islands have a wonderful similarity to Barbados: elephantiasis and filarial diseases are exceedingly prevalent, malaria in many of them is unknown. Unfortunately the expedition was unable to perform this part of its mission, and the question is still an open one, but it is an important one, and some attempt should be made at a solution, for it may be that conditions that have kept *Anopheles*, and, therefore, malaria from spreading in these Pacific Islands are of such a nature that they could be introduced and used elsewhere as a prophylactic measure.

"Or it may be, as Mr. Gibbons suggests, that *Anopheles* had never been imported; exceedingly unlikely as regards Barbados, considering its proximity to and constant communication with other West Indian Islands, but quite possible in the Pacific Islands.

"There is another and even more important point bearing on the relation of *Anopheles* to malaria which demands study and might carry with it useful practical suggestions. It is this: in certain malarial regions there are circumscribed areas, islands of health—as it were—in a sea of disease, in which, although *Anopheles* abound, malaria is absent. Such places are known to exist in India, Italy, and Mauritius. An effort should be made to ascertain reasons for this apparent anomaly. A hundred speculations crowd on one to supply an explanation, but until substantiated by actual observation on the spot, it is useless to indulge in them.

"The solution of this and kindred problems require a man's whole time and attention, and the first step towards a solution is to find that man; the next to pay him.

"I suggest this as a first step in a practical measure to those interested in the health of the West Indies and other malarial countries."

It is plain that the broad question of malarial prevalence and non-prevalence is a complex one, and requires further investigation. The influences that determine the distribution of the various species of mosquito are undetermined. Some species may be excluded from a particular locality by absence of necessary conditions, others may be excluded from the locality by the presence of an infinite variety of unfavourable conditions.

Translation.

A PECULIAR MAXILLARY DISEASE AFFECTING THE HORSES AND MULES IN WEST AFRICA.

By Dr. Hans Ziemann.

Chief Naval Staff Surgeon and State Surgeon (Cameroon).

(Translated by P. Falcke.)

The pathology of the Tropics still continues to present a number of problems, and we still hear of new forms of disease in man and beast which require close investigation.

Towards the end of 1902 I was able to confirm the existence of a pecular disease in the horses and mules of the Cameroon Mountains. This disease bears some resemblance to the nasal enlargement "ngundu" (goundou and anakhrê) of negroes on the Ivory Coast, Upper Guinea; the two ailments, however, are not identical.

The symptoms of the disease are as follows:—

A bony enlargement gradually appears on each side in the region of the external aspect of the upper jaw. At first the tumour is quite smooth and occupies the entire exterior surface of the upper jaw, with the exception of the most anterior part, and a narrow strip about an inch in width which runs along the palatal margin. The skin remains movable over the tumour, which during the following months becomes more and more prominent, and is distinctly distinguishable. The tumour does not appear to be painful on pressure. The buccal cavity is also involved, as it is observable that the palatal process of the upper jaw exhibits no concavity, but is quite flat. Simultaneously an increasing thickening on either side of the lower jaw may take place, in which, however, the submaxillary angle and the vertical rami do not participate. In the lower jaw the tumour commences in the region of the mental foramen and embraces the horizontal ramus in its entire length and breadth, only decreasing at a distance of about three inches from the chin. Under such circumstances the horizontal ramus of the lower jaw may be increased to double or even three times its normal thickness.

In the nasal cavity one observes how the symmetrical tumour growing towards the inner aspect of the superior maxilla more and more, causes it to arch towards the nasal septum, rendering the nasal passages narrow and consequently breathing difficult. The mucous membrane of the nose becomes hyperæmic, and exudes increasing quantities of light, viscid, non-odorous mucus.

No secretion of blood or pus was ever observed. Respiration becomes more and more accelerated and difficult. Finally, even at a considerable distance one may hear the loud whistling breath of the animal, and a few days before death the respiration becomes a series of pants, interrupted by frequent rattling. At this stage the animals present a sad spectacle. Though at the commencement of the disease the appetite is maintained, emaciation soon sets in. A few days before death the appetite is lost, and the animals, with their deformed heads bent, stand there gasping until they are killed to save them from the agony of slow suffocation. Sometimes, however, tracheotomy is performed. The duration of the disease, from the beginning of the first visible symptoms until death, appears to vary between four and twelve months. The temperature does not rise during the course of the disease, but the pulse is somewhat accelerated. Urine and fæces remain normal.

In spite of the gradually increasing dyspnœa, the general condition is but little affected until within a few weeks before death. I never observed squinting in consequence of the tumours; the eyes were always bright.

The blood, in spite of repeated examination, exhibited no abnormalities, with the exception of a few isolated piroplasma of minute size, and to which the native cattle are more or less immunised.

Post Mortem.—The internal organs exhibit nothing out of the common. A small quantity of turbid serous fluid is met with in the pericardium. The heart muscle is relaxed, of moderate thickness, and with deposits of fat.

The lungs are plethoric, contain little air, and the dependent parts exhibit indications of condensation. Both the lower lobes are partially connected with the pleura costalis by fresh fibrinous deposits. The larger bronchiæ and trachea are covered with viscid, glairy mucus.

Nothing abnormal in the spleen.

Liver of medium size, usual colour and somewhat soft. On incision the acini are found to be fatty.

Kidneys.—The cortal substance is parenchymatously turbid. Capsule difficult to remove in places.

No peculiarity in either the intestines, stomach or brain.

After removal of the skin, muscles, eyes, &c., which are all normal, the skull was sawn into bilateral halves and then across, so that the entire buccal and nasal cavities were exposed to view. The mucous membrane of the mouth is seen to be normal, and there is no sign of actinomycosis.

There is a copious secretion of mucus on the

mucous membrane of the nasal cavity, especially in the lateral portion, the mucous membrane there being thickened and hyperæmic. The nasal cavity itself, though constricted by the encroachment of the bony tumour, exhibits no trace of either present or past ulceration. No ulcerations are to be seen on the periosteum of the upper and lower jaw. The teeth are likewise perfectly normal. On transverse section the body of the lower jaw is found to be considerably thickened, as mentioned above. The hyperplastic processes of the upper jaw, sawn through transversely, are found to consist of somewhat thickened periosteum and a compact bony envelope ¼ to ½ mm. in breadth, which covers a hyperæmic, spongy, bony substance. On transverse section of the much thickened upper jaw one observes that here likewise the bony tumour consists of a spongy substance rich in blood, completely filling the entire antrum of Highmore, which is enveloped under the periosteum in a shell of compact, bony substance 3 to 4 mm. in thickness. There was no trace of sarcomatous elements nor of the passage of larvæ of insects or other parasites. Stained streak preparations showed no peculiarities. There were no bony enlargements on other parts of the body. The skull, preserved in formalin, was shipped to Germany for further examination, but was unfortunately lost *en*

FIG. 1.

route. I, however, later on came into possession of a horse's skull which lacks the intermaxillary bones, but distinctly exhibits the peculiar tumour (fig. 1).

This skull shows the symmetrical thickening of the horizontal parts of the lower jaw and the sharply circumscribed bony tumour which includes the region of the upper jaw. The tumour of the superior maxilla measures on each side from front to back 25 cm. in length, and vertically 12 cm. The surface of the palate of the upper jaw is flat, in contradistinction to the normal, which is concave. The tumour is most powerfully developed longitudinally in both upper and lower jaws in a direction corresponding to the course of the teeth. The zygomatic process of the upper jaw on both sides is almost obliterated in consequence of the encroachments of the tumour. All the other bones of the head are normal.

This disease was first observed in 1901 in a four-year-old powerful stallion. Unfortunately I could not discover where he was bred. His illness lasted five months from its commencement to the death of the horse. At this time there were two or three horses in the same stable and a mare three years old, which was born in Buea. At the commencement of October the typical enlargement began to form, but the process of disease in this case was very slow. I saw this mare in November, 1902, in the condition shown in

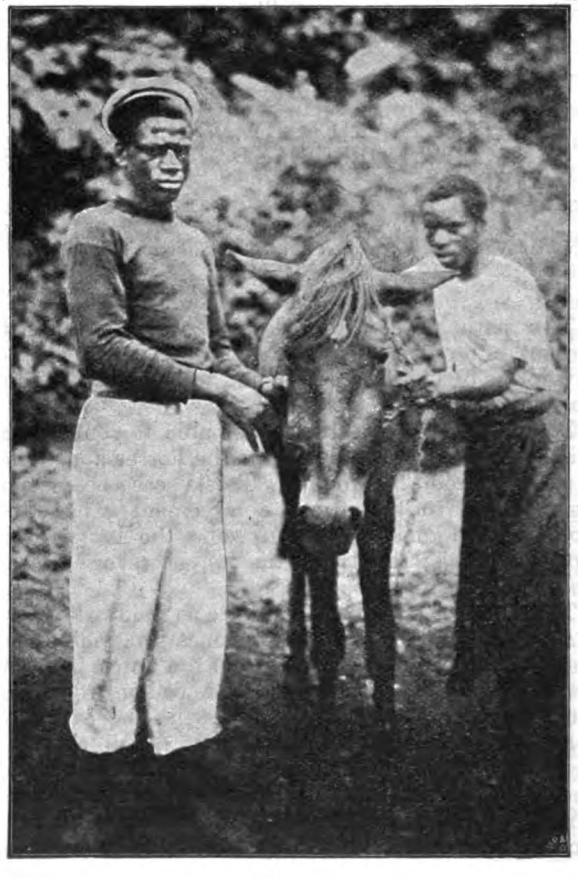

FIG. 2.

fig. 2. There was considerable dyspnœa, and the animal died after a few months.

A four-year-old gelding, formerly always healthy, was placed in the same stable with the sick mare in February, 1902. By the end of March the gelding developed a symmetrical, bony tumour, which gradually increased in size, and was accompanied

by severe dyspnœa. I took the animal to Duala, in order to observe it further, and it died there in February, 1902.

In September, 1902, a powerful horse imported from Lagos to Victoria, at the foot of the Cameroon Mountains, died after a four months' illness and under the symptoms described above. This horse had frequently been ridden to Buea, where it may have come into contact with diseased horses.

In Buea, even before my arrival, the sick animals had been carefully isolated, and not allowed to graze on the same pasture, and the stalls were supposed to have been thoroughly disinfected. Nevertheless, in January, February, and March of 1903 three adult horses were attacked, as well as a mule, which died. I recommended that the horses should be treated in the following manner: Every morning and evening the nasal cavities were syringed with a warm solution of physiological salt. For a fortnight every horse had 20 to 30 gr. of iodide of potash daily mixed with its food, and the entire region of the tumour was thoroughly rubbed with grey ointment. All these animals are said to have been cured by this treatment, but the author has only written communications to that effect.

In any case, the prognosis is very unfavourable in untreated cases. It is worthy of remark that hitherto there have been no cases of the disease in foals, though this statement must be accepted with caution on account of the limited total of cases.

Stallions, mares, and geldings are all liable to the disease. Of the few mules here one was attacked; not one of the twenty-five asses in Buea showed symptoms of the ailment, though they were subject to animal malaria in a severe form, and some died from it.

I never observed in the native population cases of nasal enlargement such as exists in Sierra Leone, &c. Goundou also, the points of departure of which are the nasal processes of the maxilla superior, only appears in the negro at the age of 14, and has an exceedingly chronic course, it being possible for the patients to live thus afflicted for many years without, to my knowledge, feeling any great inconvenience, though dyspnœa may occur, but not to a marked degree. Dr. Schütz has called my attention to the fact that man breathes through both nose and mouth, whilst horses can only breathe through the nose. This is an important factor in the difference of the duration of the disease in man and horse. One negro seen by me in Sierra Leone had had goundou for eight years, the tumours being about the size of walnuts on each side. In this case there was a considerable secretion of mucus from the mucous membrane of the nose. There was, however, in this case no thickening of the lower jaw, and there was no dyspnœa, causing breathing through the mouth. Moreover, this disease of indigenous persons usually offers a good prognosis *quo ad vitam*. One may therefore observe that there are considerable differences between goundou and the so-called maxillary disease of the horses and mules of Cameroon. It may also be mentioned that the sick animals had always had the same sort of food and stable accommodation as the healthy ones.

Etiology.—The nasal mucus was removed with a sterile pledget, and

(1) On November 24th, 1902, was well rubbed on to a horse coming from Jaunde, in the interior of Cameroon, which was suffering from chronic nagana, though there were no parasites in the blood at the time.

(2) On November 24th, 1902, the same was done to a mule, likewise suffering from nagana, and coming from Jaunde. Very few parasites in the blood.

(3) On January 4th, 1903, nasal mucus removed with a sterile pledget from the same sick horse was rubbed into the nostrils of two asses from Adamana which were suffering from chronic animal malaria (piroplasma type), and the experiment was repeated three times within the next fortnight.

This horse (*Exp.* 1) died on December 29th, 1902, and on the 35th day of observation, from chronic nagana, and without exhibiting a tumour.

The mule (*Exp.* 2) died on January 13th, 1903, after 49 days' observation, from chronic nagana; at the obduction there was no sign of a tumour in course of development.

Exp. 3.—Of the two asses, the first died after 63 days' fruitless observation from the results of artificial infection with *Trypanosoma vivax;* the other ass was still alive when I left Cameroon at the end of April, 1904.

From the above one may gather that, even if the nasal mucus contains specific germs of disease, the period of incubation must be at least fifty days for horses and mules—which seems very improbable—and asses are not susceptible.

On February 15th, 1903, the horse brought from Buea died. In the previous November streak preparations from the nasal mucus had been made and cultures placed on agar-agar. No parasites were found in the streak preparations. In numerous cases the following microbes were cultured again and again :—

(1) Thick, plump, almost roundish immotile bacilli, much granulated, 2μ in length, and with rounded-off angles.

(2) Diplococci.

(3) Staphylococci.

I was unfortunately unable to follow the biological development and other qualities of this micro-organism, but solutions containing the pure cultures were rubbed several times into the nasal cavities of the experimental animals with negative results as mentioned above. No larvæ of diptera were ever found which might have caused the hyperplasia by setting up reactive inflammation, so the etiology of this disease still remains shrouded in mystery.

I sent Laveran the photographs, and recently I had a letter from him informing me that in Madagascar there occurs a disease in horses which may be identical with the ailment I have described. Moreover, another disease has been observed which appears to be similar in etiology to mine: "Ostéoporose des mulets algériens transportés au Tonkin."[1]

Perhaps this article may furnish a stimulus for investigation and research in other colonies, and, as all other treatment has hitherto been futile, that proposed by me may be given a trial.

Addendum.—After the completion of this article I received a reprint from Laveran, "Sur une maladie infectieuse des equidés, avec altérations du système osseux, observée à Madagascar," par MM. Charon et Thiroux, in which there are two references to a

1 Ballu, *Recueil des mémoires et observat. sur l'hygiéne et la méd. vét. militair*, i., xx., 1899.

similar disease: (1) Germain, "Sur une maladie observée sur des chevaux égyptiens importés en Cochinchine" (*Recueil de Médecine Vétérinaire*, 1881, juillet et suiv.); (2) Pecaud, "L'ostéomalacie des Equidés au Tonkin" (*Revue Générale de Médecine Vétérinaire*, janvier, 1904). In the latter the author directs attention to the infectious nature of the disease.

Charon and Thiroux describe an infectious disease with alterations of the osseous system, which has some analogy to the osteomalacia observed in Indo-China. In this disease there are manifestations of paresis and weakness, and the conjunctivæ are yellow. There is fever, acceleration of the pulse, increased frequency of respiration, occasionally also hæmoglobinuria; hypertrophy and hyperæmia of the liver and spleen may set in, and finally also paraplegia. Spontaneous fractures of the bones may occur, as well as enlargement of the upper and lower jaws and of the nasal bone. These deformities of the bones may also occur in very acute cases. The duration of the disease averages from sixteen to twenty days, or may go on for several years. The liver and spleen are found at obductions to be hypertrophied, and the liver is frequently yellow in colour. Above all, the comminutive fractures of the bones and the fragility of the tendons appear to be characteristic.

Thiroux has confirmed piroplasmosis in a few cases of osteomalacia of horses in Madagascar, but by no means in all cases, so that the etiology of this disease is still obscure.

The symptoms presented by the horses as described by the French authors exhibit considerable differences from the specific affection of horses and mules in Cameroon described by me.

I shall be grateful to receive communications as to similar conditions from other parts of the Tropics for purposes of comparative investigation and research. — Translated from *Archiv f. wissnesch. u. prakt. Tierheilk.*, vol. xxxi., 1905.

EXTRACT OF A LETTER RECEIVED FROM AN OFFICER RESIDENT IN NORTHERN NIGERIA.

Outfit for the Interior of a Tropical Country.

To combine cheapness and efficiency is the object of the following rough notes. A man going to Northern Nigeria should bear in mind that he has to live there, and is not going there for a mere month or two; also that a certain amount of comfort is essential for good work and sound health.

All but very bulky articles can be got after arrival through the post. There is no difficulty now about Customs on Post Office parcels.

Mosquito Netting.—Get smallest mesh available. But if you cannot get a very small mesh get a book muslin net with a few yards for repair. To obviate necessity of frequent repairing (daily in fact, otherwise fever for certain), get edges bound with linen with cross bands. The usual (and most idiotic) method is for the whole net to go *over* the poles with the shot-weighted ends trailing on the ground. If poles are used the ends should always be tucked *under* the blankets and consequently hung *inside* the poles by means of tape loops through which the poles can pass. The ends of the net should be bound with linen so as to reach say, six inches above surface of bed when tucked in. This is to prevent your hands and feet getting bitten by resting them against the linen.

One mosquito curtain as above, with a few yards for mending and for doors of huts, is ample.

Bed, &c.—X-bed cannot be beaten. Mosquito poles as at Way and Co.'s, a good idea.

Usually you can do without poles altogether by having good cord to tie ends to roof, &c.

Mattress.—Cork best. Way and Co.'s, good and cheap.

Pillow.—Get wire-spring pillow, though have not tried it myself.

Sheets.—One pair Jaeger sheets *at least*. Small size good enough for camp bed. Usual size far too big. *Two* pairs best for fever.

Blankets.—Take out two thin, two thick, any kind.

Pyjamas.—Three suits of Jaeger's thinnest will be enough. If enough in hand of ordinary sort, do not worry.

Belly-band.—Absolutely necessary here, where a stomach chill at night (they are only worn at night) is so easily got, and so very dangerous. I find a strip of Jaeger's sheeting with tapes do well. *Two* bands enough.

Mosquito Boots.—These are simply very loose and thin boots with loose uppers to tuck trousers into, *e.g.*, like a top boot, but extremely loose. Made to order in canvas or buck-skin. Can be got sometimes in Canaries, and can be easily purchased in N. N. in most provinces.

Uniform.—Two white mess jackets, three pairs white trousers, one white tunic, one khaki tunic, *quite* enough. *Re* revolver—see notes *re* firearms. Three white mess shirts (soft linen), half a dozen collars.

Clothing.—Get your measure taken at home, and you can order out what you want afterwards. Take out two pairs riding breeches (not khaki drill, but khaki or other cord), three pairs khaki slacks (ordinary trousers), clothes for board ship (they do not dress there), one suit flannels (dark), and one suit dark for night, with usual clothes (old) you have. Take out *all* your clothes, as you do not know where you may have to go. Climate varies from average of 90° to average 78°, running up and down from 110° to 32°!!! On the Kano Expedition, while marching, *i.e.*, on foot, men had to wear great coats, and then could not keep warm in the harmattan season (windy season, December to March, about). Shirts, &c., usual ones or board ship, of course. Shirts for camp, three thin flannel, with quilted spine pad attached, and one dozen 2s. soft white shirts, without collars. In each case have neck two sizes too large; collars of each, detachable, same size. Great coat absolutely necessary. Waterproof (for horseback) *very* necessary. One khaki helmet (uniform) enough. One Cawnpore pith helmet.

Boots.—Get three pairs of strong light tan lace-boots without nails, but take plenty of sole-protectors with you. Gaiters, of course, also one pair "field-service" riding-boots. Do not know them myself, but men out here swear by them.

Saddle, &c.—Semi-Colonial best, small size. Fit for wallets, of which a pair is useful. Soft-soap, plenty. Have two canvas water-bags to hold a quart each, with leather guard to save horse, made to strap to saddle. Get small wooden tin-lined case with lock to hold saddle, &c., only; total weight, 50lb., inclusive of saddle, &c.

Tiffin Basket.—May seem a mere luxury. Is no such thing, though, like almost everything else, you can "do without it." Do *not* get it fitted, but have compartments to take the following: Two sparklet (metal) bottles; one bottle whisky; two small bottles "fizz"; luncheon tin; mustard, salt, pepper pot; two large knives; two small knives and forks; two desert spoons; two tablespoons; one glass (in wicker); one metal mug; two metal tea cups; two small aluminium plates; two large ditto; two soup plates; three or four aluminium deep dishes to hold anything from soup to roast. The whole basket should not weigh more than 40lb., fitted as noted. Include two small tablecloths to fit table 2 ft. 6in. by 2ft.; tea-pot and coffee-pot of aluminium. Above is for camp use exclusively.

Cooking Pots.—If you can afford it get two aluminium saucepans, one small aluminium kettle for camp, but do not worry about this. Ordinary pots, &c., you can buy at Niger Company's depôt, but as you usually have to start from Lokoja almost before you have arrived, best to have three small saucepans (enamelled) and one kettle; also four iron supports for same.

Headquarters Mess Kit.—You are almost sure to have to entertain casually, at least, so take half a dozen sets *complete* best enamelled ware procurable—knives, forks, spoons, &c., cheap, but all marked, say, "C. D.," otherwise they will go astray for dead certain. Three tablecloths, and one dozen napkins essential, also one dozen glasses, toast-rack, &c., mincing machine, &c.

Bath.—Usual canvas bath and basin combined very good. Tin bath in wicker case, &c., either very heavy or much too small.

Boxes.—Get *small* size uniform cases only, which when full will weigh only 50lb. It will be more expensive, of course, *e.g.*, more boxes required, but if you have to march forty days at a stretch, up to Sokoto, for instance, it is well worth having light loads for the carriers. *Four* cases should do you, or perhaps five, last being for books, papers, medicines, filter, &c.; rest of clothes (old ones and rough ones, boots, &c.) jam into cheap, *locked* kit-bags at 12s. 6d. each.

Filter.—Usual thing is to go in for the smallest size hand filter, which I think a great mistake; gets clogged very easily, necessitating constant scrubbing of cylinder (almost every bottle filtered necessitates cleaning of cylinder), and is very hard to manage as it slips about all over the place. Inspect the Berkefeld filters yourself and choose a *foot-rest pattern*, which a boy can manage easily.

Medicine.—Burroughs and Wellcome's three-guinea chest much too bulky and awkward; small wallet size ample. Take out quarter of a dozen clinical thermometers, as they break so easily.

Provisions, &c.—You should get six months' supplies of bare necessaries, without which you cannot do, and among these you cannot class meats or vegetables, as both of these can be obtained fresh, and it is bad to live on tinned meats, &c. Meat you get in the country is: (1) Fowls (miserable things, but still eatable). (2) Mutton of sorts, or goat. Turkeys, ducks, beef, pigeons, guinea-fowl, partridge, &c., can be got in some places. To make sure, however, have, say, one box tinned meat, &c., and one box tinned vegetables separate from the others. The only procurable country vegetables are sweet potatoes, yams, onions, beans, and a kind of brinjal.

Pack your twelve boxes *necessaries* as follows, each box enough for two weeks: Flour, 12½lb.; yeast or baking powder, ½lb.; tea, 1lb.; coffee, 2lb.; cocoa, ¼lb.; sugar, 6lb.; milk (smallest size tins), 4lb.; salt, ¼lb.; rice, 8lb.; potted meats (1d. tins), 1lb.; jams, 4lb.; Lazenby's soup, ½lb.; dried fruits for stewing, 3lb.; chutney, ½lb.; curry powder, 1lb.; sparklets (4 dozen), 1lb. Total net weight of contents 40lb. Box, say, 8lb. = 48lb. One box tinned meats at 1s. per lb. average = 40s. One box tinned vegetables at 6d. per lb. average 20s. (Really sufficient would be 20lb. meats, 20s.; 20lb. vegetables, 10s., 30s. One case quite enough.

Battery.—A good second-hand twelve-bore (*not* Jeffery's wild-fowl gun, which is quite useless for sport, being too heavy and clumsy); 500 cartridges, No. 5; 200 No. 4; 200, No. 2; 50 No. 1.

Revolver; would advise (unless you have a revolver) to get a double-barrelled twenty-bore slug-pistol; you cannot miss with it, and riding along you often get a snap-shot at guinea-fowl or partridges along the road—sitting shots. Take out 100 cartridges.

Rifle; do not worry as there is very little game to be had. If you have one, take it out; if not, you have numberless chances of picking up one cheap out here; and it all depends where you are stationed as to whether you will get a shot in the year.

Glasses.—Bring yours out. Do not buy a pair; bush is too thick to be of any good.

Lamp, Punkahs, &c., &c.—Lamp; Lord's lamp essential. Better take some oil, too, for going up the river from Burutu. As these notes are all for economy, I shall not dwell on the great boon of an electric lamp, You can get a first-rate fan, I believe, for £10. Should get lamp, too, for same amount.

Folding Book-shelves.—Two cheap sets for wall; very useful.

Reviews.

A Treatise on Plague, dealing with the Historical, Epidemiological, Clinical, Therapeutic and Preventive Aspects of the Disease. By W. J. Simpson, M.D.Aberd., F.R.C.P.Lond., D.P.H.Camb., Professor of Hygiene, King's College, London; Lecturer on Tropical Hygiene, London School of Tropical Medicine; formerly Health Officer, Calcutta; Medical Adviser to the Government of Cape Colony during the Outbreak of Plague in 1901; Commissioner for the Colonial Office to enquire into the Causes of the Continuance of Plague in Hong Kong. Pp. 466. Illustrated.

Price, 15s. net. Cambridge: at the University Press, 1905.

Preliminary Notice.

Professor Simpson's "Treatise on Plague" is especially welcome at the present moment. We have reached, it is to be feared, a callous state of mind concerning the malady and seem to be content to merely chronicle its ravages. The condition of India at the present moment is one that especially calls for a remedy, if remedy can be found, but up to the present moment the sciences of medicine and hygiene seem foiled. Could Professor Simpson's trenchant words be seriously taken, it would become us to apply ourselves to the amelioration of this terrible scourge, if not for the honour of medicine and the justification of medicine as a science, at least for the sake of humanity and the relief of suffering. The means of fighting plague are clearly demonstrated by Professor Simpson, who has won his spurs in that direction in several countries. At the Cape of Good Hope and at Hong Kong the practical suggestions made by him were the result of careful investigations and study, and the benefits accruing to his efforts afforded excellent evidence of the public good likely to follow from scientifically applied hygiene.

Plague must in future be dealt with by the hygienist; the bacteriologist has so far performed his part, he has told us the cause of plague and shown us how the *Bacillus pestis* behaves in innumerable media and how it reacts under varying conditions. Practical hygiene is what is now required of us, and aided by bacteriology, has a great work to perform.

Part I. of the "Treatise on Plague" deals with the history and distribution of plague, and had Professor Simpson given us nothing more than this section of his great work we would have been content to have thanked him for his labours. He traces plague from biblical and early Christian times through all the centuries down to the present day; an excellent piece of historical writing compiled with infinite pains and sound judgment.

Part II. deals with the epidemiology of plague, and in the eight chapters devoted to this aspect of the disease the epidemiologist and bacteriologist will find every sentence interesting.

Part III. is devoted to plague in the individual. Here the clinician and pathologist will appreciate the succinct accounts of the morbid anatomy and pathology, the clinical features, the diagnosis, prognosis and treatment of plague contained in Chapters XII. to XVI.

Part IV. includes Chapters XVII. to XXI., and is concerned with the "Measures for Prevention and Suppression of Plague." This part of the treatise is written with the true instinct of the expert, and is the best in a book in which all is good.

Appendix I. affords a tabulated view of the plague in India during 1904, when no less than 1,040,429 persons succumbed to the disease.

In Appendix II. is published the full text of the International Sanitary Convention of Paris, 1903.

The treatise is illustrated by maps, diagrams, clinical charts and photographs, which serve to complete a work which is creditable alike to the author and to the publishers, besides being a valuable addition to permanent medical literature. J. C.

Correspondence.

THE DEVELOPMENT OF FILARIÆ IN THE MOSQUITO.

TO THE EDITOR OF THE "JOURNAL OF TROPICAL MEDICINE."

DEAR SIR,—My apology for committing the following somewhat nebulous matter to print is that I have no opportunity of further investigation.

There is in Sierra Leone a certain Culex mosquito which is very common. The mosquito has not yet been identified. As far as I could make out, this mosquito is not a blood-sucker.

Just before leaving West Africa for this country I found in the thorax of one of these mosquitoes two motile worms, and in another mosquito of the same species I found a single worm.

The organisms resemble figures (*b*), (*c*) and (*e*) 33 shown on page 563 of "Manson" as stages of the *Filaria sanguinis*.

If the mosquito proves to be not a blood-sucker, the finding of filariæ in its body becomes interesting. I have asked a colleague to pursue the investigation further.

The fact of the existence of such filariæ would not necessarily clash with the accepted account of the development of *Filaria sanguinis*, for the worms may be some other kind of nematode having a similar appearance, but being possibly harmless.

It will require, however, to be made known if a harmless mosquito contains these worms; for, according to current views, the discovery of filariæ in the tissues of any mosquito is, I imagine, presumptive evidence that the insect is dangerous to man or some lower animal.

I am, Sir,
Yours faithfully,
F. SMITH,
Major, R.A.M.C.

Woolston, Southampton,
April 22nd, 1905.

New Books.

THE WELLCOME PHYSIOLOGICAL RESEARCH LABORATORIES, BROCKWELL HALL, HERNE HILL, LONDON, S.E. Director, W. Dowson, M.A., M.D.

The following interesting papers have been issued as reprints by the Wellcome Laboratory authorities:—

(1) The Chemical and Physiological Assay of Digitalis Tinctures. By George Barger, M.A., D.Sc., and W. Vernon Shaw, M.A., M.D. (Oxon.).

(2) Acute Rheumatic Fever and its Etiology. By W. V. Shaw, M.A., M.D. (Oxon.).

(3) A Microscopical Method of Determining Molecular Weights. By George Barger, M.A., D.Sc.

Should any reader of the Journal desire a copy of any of these articles they will be forwarded on application to the Editor.

Notes and News.

No fewer than 215,326 persons died of plague in India during the month of March, 1905.

BAD NAUHEIM.

The Lindenhof Sanatorium.

Nauheim is so well known to the medical profession throughout the world that but little can be said to further enhance its claim as a health resort and as a "cure." In the pleasant vicinity of the bath-houses, the springs and the park, is the magnificent and well-equipped sanatorium of Lindenhof, under the direction and care of Dr. Wachenfeld. In this sanatorium not only will the invalid find comfort, but anyone travelling for the purpose of change of air and environment will find in the grounds and gardens and in the immediate neighbourhood much to attract and to occupy the attention and to interest.

The site of the sanatorium has been wisely chosen, and the building has been erected with all the requirements of the most advanced hygiene fully carried out. The food is excellent, and the attendance all that could be desired. The charge for board and residence varies from 10 to 30 marks per day, according to the requirements of the visitors.

Nauheim has become known chiefly as a resort for persons suffering from heart diseases; it may be pointed out, however, that in some way this reputation has served to prevent the full advantages of Bad Nauheim being enjoyed, for it is principally for persons suffering from so-called blood diseases, such as gout and rheumatism, that the "cure" is most useful and efficient.

Tropical residents returning to Europe for a change, or to get rid of malarial, hepatic, or splenic troubles, will find Bad Nauheim to be one of the most pleasant and curative of the many spas of Europe.

CYLLIN.

Prepared by Jeyes' Sanitary Compounds Company, Limited.

We have on several occasions drawn attention to this excellent drug. In the article by Dr. Hartigan on the utility of Cyllin in cases of sprue which recently appeared in the Journal, the undoubted benefits attributable to the drug in this disease were clearly and convincingly stated. The Jeyes' Sanitary Compounds Company has devoted infinite pains to perfect this drug and bring its usefulness before the medical profession.

We have now further proofs of its power as a disinfectant, as the following comparative tables will show:—

Bacteriological Test.

Method.—To 5 cc. of a particular dilution of the disinfectant in sterilised water, add 5 drops of a 24 hours' blood-heat culture of the organism in broth; shake, and take sub-cultures every 2½ minutes up to 15. Incubate for at least 48 hours at 37° C.

Sample.	Organism.	Carbolic Acid Co-efficient.	Price per Gall.	Cost of Disinfectant equivalent to 100 Gallons of Carbolic Acid.
Carbolic Acid ..	Plague ..	1·0 ..	1/0 ..	£5 0 0
Formalin	Plague ..	0·3 ..	5/6 ..	91 13 4
Cyllin	Plague ..	34·0 ..	4/0 ..	0 11 9
Carbolic Acid ..	Cholera ..	1·0 ..	1/0 ..	5 0 0
Formalin	Cholera ..	0·3 ..	5/6 ..	91 13 4
Cyllin	Cholera ..	32·3 ..	4/0 ..	0 12 4

In December, 1904, Professor C. Fraenkel, of the University of Halle, stated:—

"It follows clearly from these results that the toxicity of Cyllin for animals is relatively limited, and in no way comparable with that which is exerted by, for instance, carbolic acid. Taken in context with the astonishing efficiency of Cyllin in the disinfection of the various pathogenic bacteria, this fact must be described as extremely satisfactory. I do not doubt, therefore, that Cyllin will obtain general use for the purposes of disinfection as a preparation of extraordinary utility."

In the *Lancet* of April 15th, 1905, Dr. E. Klein, F.R.S., reports most favourably upon the germicidal influence of the "Cyllin inhalant."

The important lesson in practical hygiene demonstrated by Dr. Klein and F. T. Allan, published in *Public Health*, October, 1904, on the potency of Cyllin in destroying tubercle in sputum on the floors of public resorts, is a marked testimony to the efficacy of Cyllin in this direction. All that is necessary is to well wash the floor with a mop dipped in a solution of Cyllin water, 1 in 160 (3 oz. Cyllin to 3 gallons of water, *i.e.*, 6 tablespoonfuls in a pail of water). A floor kept moist with this solution overnight will be free of tubercle bacilli, presuming any were present, by the morning. *Cyllin* is a safe, potent, and eminently practical disinfectant.

Our own experiences entirely support the statements concerning the benefits to be derived from the use of Cyllin as a drug and as a disinfectant.

Obituary.

DR. JOSEPH EVERETT DUTTON.

It is with sincere regret that we chronicle the death of Dr. J. E. Dutton, whilst engaged in the investigation of trypanosomisis of tick fever, at Kosongo, in the Congo, on February 27th, 1905. The information only reached us as we were going to press, so we are compelled to reserve an account of the life of this distinguished man until our next issue.

Geographical Distribution of Disease.

As information arrives we publish, under this heading, the principal diseases met with in tropical and sub-tropical countries, so that those interested in the Geographical Distribution of disease may have a means of gathering information concerning the prevalent ailments in different parts of the world.

Plague.

Prevalence of the Disease.

India.—During the weeks ending February 18th and 25th, March 4th, 15th, 18th and 25th, April 1st and 8th, the deaths from plague numbered 27,837, 29,465, 34,139, 45,543, 47,688, 53,895, 57,702, 52,841.

South Africa · East London.—Weeks ending February 25th, March 4th, 11th, 18th and 25th,

April 1st, fresh cases 1, 0, 4, 2, 3 and 5; deaths 1, 0, 3, 2, 1 and 1. *Port Elizabeth.*—Fresh cases 0, 0, 0, 1, 0, 0; deaths 0, 0, 0, 0, 1 and 0.

Mauritius.—Week ending March 16th, fresh cases 1; deaths 1. From March 16th to April 25th no plague.

Hong Kong.—During the weeks ending March 11th, 18th and 25th, April 1st, 8th, 15th and 22nd, fresh cases 0, 0, 1, 2, 3, 1 and 1; deaths 0, 0, 0, 2, 3, 1 and 1.

Penang.—One case reported on March 11th.

Queensland: Brisbane.—During the weeks ending February 18th and 25th, March 4th, 11th and 18th, fresh cases reported 5, 3, 1, 2 and 0; deaths 0, 3, 1, 1 and 0.

Brazil.—From January 1st to March 12th, 1905, the deaths from plague in Rio de Janeiro numbered 40.

Chili.—At Pisagua, a town of 3,000 inhabitants, 150 persons died of plague during the week ending March 4th. Plague is also reported at Tacna and Arica.

Hawaiian Islands.—On March 2nd, 1 case of plague reported at Honolulu.

Egypt.—On March 29th, 3 cases of plague reported, 2 in Kalioubieli, 1 at Minieh

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Indian Medical Gazette," February, 1905.

1. Five Cases of Snake-bite Successfully Treated by the Local Application of Permanganate of Potash. Collected by Leonard Rogers, M.D., M.R.C.P., Capt. I.M.S.

2. Notes on the Presence of Spirilla in a Tropical Ulcer. By Lieut. W. S. Patton, M.B.

3. Plague Rats and Fleas. By W. G. Liston, Capt. I.M.S.

4. Some Clinical Features of Quartan Malaria. By M. Watson, M.D.

5. What Surgical Procedure in Liver Abscess Gives most Chance to the Patient. By Capt. Clayton Lane and R. P. Wilson.

(1) Rogers gives details of five cases of snake-bite treated by permanganate of potash.

Case 1.—Bitten by Russell's viper in thumb, tied ligature round wrist, site of wound incised, permanganate of potassium crystals moistened with water rubbed into wound. The permanganate was applied in less than two minutes after bite, and the ligature kept on for three-quarters of an hour. The patient recovered without subsequent symptoms.

Case 2.—Bitten on forefinger by a cobra. Wound incised immediately, and permanganate of potassium crystals rubbed into wound. [It is not mentioned whether a ligature was applied to the finger or not.] No signs or symptoms occurred.

Case 3.—Bitten on foot by a cobra. Ligature applied just below the knee, wound incised and dry-cupped for ten minutes, crystals of permanganate of potassium applied. Leg shaved, cleaned, and vertical incisions at $\frac{3}{4}$ in. intervals made up to knee; the leg was immersed in a concentrated permanganate solution for about half an hour, when ligature loosened. No symptoms of snake-poisoning resulted.

Case 4.—Bitten by cobra in right knee. Ligature applied above wound, bite incised, wound washed with a hot solution of permanganate, and bandaged tightly. Three hours later 10 cc. antivenin was injected hypodermically, and repeated an hour later. No symptoms of poisoning developed.

Case 5.—The bite was incised, and permanganate of potassium applied. [The species of snake is not mentioned, nor whether a ligature was applied or not.]

(2) Patton, whilst in charge of the Native Military Hospital at Aden, had an Arab patient with a large ulcer on lower third of left leg. The ulcer was discharging pus, and the whole leg was swollen and indurated. The patient had just recovered from a fever which had lasted four weeks. The patient was emaciated, had pyorrhœa alveolaris, a markedly enlarged spleen, and a slightly enlarged liver. Film preparations from the gums of a case of relapsing fever and from the ulcer mentioned above, stained by Leishman and by carbol-fuchsin, showed spirilla, but no Leishman-Donovan bodies or malarial parasites were found. No difference between these spirilla could be made out, and they also corresponded exactly with *Spirilla buccæ* and *Bacillus busiformis* of Vincent found in films of pus from the gums.

(3) Liston defines plague as a rat disease which is occasionally communicable to man. There are two species of rat: *Mus decumanus*, the brown, or Norway rat, is the common European species, and the *Mus rattus*, the black rat, the common domestic rat of India. The brown rat lives more apart from man than the black rat, and the expulsion of the latter when the brown rat invaded Europe in the 17th century no doubt explains the disappearance of plague in Europe. Plague is likely to spread among men in proportion as *Mus rattus* is more common and *Mus decumanus* less prevalent, and in proportion as men's habits are less or more civilised. The breeding season of rats plays an important part in the spread of plague in man, the young rats being specially liable to be attacked by fleas. The rat-flea in India is the *Pulex cheopis*, but under certain circumstances it attacks other animals. Liston shows how fleas which inhabit by preference one animal will, under stress of hunger, attack other animals, and gives several examples of this: (1) Guinea-pigs dying of plague were found covered by rat-fleas. (2) A room, in which a cat had previously lived, had been shut up for some weeks: the man who went to open up the room was bitten by many cat-fleas—*Pulex felis*. (3) A stable shut for some weeks had previously been occupied by a dog and a horse: the man who opened up the stable was bitten severely by dog-fleas—the *Pulex felis*. In all these cases the hungry fleas attacked the first animal they encountered, whether guinea-pig or man; no doubt had other rats, cats or dogs found their way to the unoccupied rooms the fleas would have pre-

ferred to feed on them and not on the human beings. These observations serve to explain the behaviour of plague in most places where it has appeared. There is (1) plague among rats with many deaths; (2) a lull; (3) then plague among men. Not only can rats communicate the disease to man, but it is equally certain that man can carry the disease to rats. That rats are the important factors in the spread of plague is still further made evident by Liston's observations that rats can live in the same cage with infected rats without acquiring the disease if only the fleas are excluded. The fact that buboes most frequently form in the groin has been advanced as an argument that the germ of plague enters by the skin of the foot, which, in people who go barefooted, is apt to be scratched or excoriated. Against this assumption it is recorded that the boot-wearing people in Australia suffered as frequently from groin buboes as the barefooted natives of India. Liston is of opinion that India can only be freed from plague gradually, and as the people recognise that rats are the most important factor in the spread of the disease. In addition to placing a distance between men and rats, protection can be obtained by acquiring immunity to plague by inoculation.

(4) Watson remarks upon the absence of the characteristic quartan pyrexia in cases of fever in which the quartan parasite was present in the blood. In no less than 60·6 per cent. of the cases observed by him was this the case. In 36·36 per cent. of the cases pyrexia was absent, and in 18·8 per cent. the temperature was normal. Watson draws attention to œdema occurring in many parts of the body, such as the feet, hands, legs, eyelids, abdomen, face, or chest. Hæmic murmurs and tricuspid and mitral valve murmurs were met with. Diarrhœa or dysentery was present in 20·4 per cent. of the cases observed. Infection by pyogenic organisms and preliminary affections are also mentioned by Watson as accompaniments of the fever, and he gives details of several cases of fever with complications, namely, chronic malaria, with great œdema, and death from thrombosis of vessels of right leg; chronic quartan malaria, with cirrhosis of the liver; quartan malaria, with parenchymatous nephritis; quartan malaria, with diarrhœa; double quartan malaria, becoming single; triple quartan malaria, with quotidian fever; chronic quartan malaria, with malarial cachexia; chronic quartan malaria, with renal complications; quartan malaria, with multiple abscesses; double quartan malaria, with chronic dysentery.

(5) Lane and Wilson, of the Presidency General Hospital, Calcutta, condemn the thrusting of a trocar into the liver through the abdominal or thoracic wall in various directions in cases of liver abscess as a relic of barbaric surgery. The procedure, according to the writers, dates from a time when to open the abdomen and examine the contained organs by sight and touch was attended by so much danger that to do so was, except in rare instances, unjustifiable. They entirely discard exploratory aspirations through the abdominal wall, and, instead, they adopt the following procedure:—

"In acute tropical abscess we have found that, as might be expected from experience of an acute abscess in any part of the body, the portion of the liver surrounding the abscess is œdematous, pitting under the finger. If the abscess is large, the whole liver may be œdematous, but in this case the œdema is more pronounced at one spot than over the rest of the organ. Guided by the hand in the abdominal cavity the trocar of the aspirator, entering the liver where this lies under the abdominal wound, is pushed on towards the place where œdema is greatest, and the abscess thus localised without unnecessary laceration of the organ. Our experience in this operation is not yet great, but it has been so entirely satisfactory, and the information yielded has been so precise, that we are not likely to again revert to the older method of blind puncture, with its attendant uncertainties; nor do we consider, judging from our limited experience of the operation, which has included some seriously critical cases, that it entails increased shock and risk; but rather that, by shortening the exploratory part of the operation, it has a contrary effect. We therefore bring it forward here, hoping that others will try it, and confident that the result will not be disappointing."

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EXCHANGES.

Annali di Medicina Navale. Annali d' Igiene Sperimentale Archiv für Schiffs u. Tropen Hygiene. Archives de Medicine Navale. Archives Russes de Pathologie, de Médec. Clinique et de Bacteriologie. Australasian Medical Gazette. Boletin de Medicina Naval. Boston Medical and Surgical Journal. Bristol Medico-Chirurgical Journal. British and Colonial Druggist. British Journal of Dermatology. British Medical Journal. Brooklyn Medical Journal. Caducée. Climate. Clinical Journal. Clinical Review. Giornale Medico del R. Esercito. Hong Kong Telegraph. Il Policlinico. Indian Medical Gazette. Indian Medical Record. Indian Public Health. Interstate Medical Journal. Jahresbericht. Janus. Journal of the Royal Army Medical Corps. Journal of Balneology and Climatology. Journal of Laryngology and Otology. Journal of the American Medical Association. La Grèce Médicale. Lancet. Liverpool Medico-Chirurgical Journal. Medical Brief. Medical Missionary Journal. Medical Record. Medical Review. Merck's Archives. New York Medical Journal. New York Post-Graduate. Pacific Medical Journal. Polyclinic. Public Health. Revista de Medicina Tropical. Revista Medica de S. Paulo. Sei-i-Kwai Medical Journal. The Hospital. The Northumberland and Durham Medical Journal. Transactions of the American Microscopical Society. Treatment. West India Committee Circular.

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Original Communications.

A NOTE ON YAWS.

By GEORGE PERNET.

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NOT long ago I had occasion to consult Dr. Victor de Rochas's Paris thesis, entitled "*Essai sur la Topographie hygiénique et médicale de la Nouvelle Calédonie* (1860)" on another matter, and came across the following references to yaws, which may interest readers of the JOURNAL OF TROPICAL MEDICINE, especially as this French author's work appears to be little known, for it is not mentioned in "Scheube" (English edition by Mr. James Cantlie), Sir Patrick Manson's third edition, and Jeanselme's "*Cours de Dermatologie exotique*."[1] De Rochas, in speaking of tonga or yaws, states that few natives escape this complaint, which in its external manifestations has some resemblance to syphilis. According to him, at the time he wrote, this disease had not yet been referred to as far as New Caledonia was concerned. It was a kind of frambœsia, he goes on to say, more like yaws than anything else. He studied it very carefully during his stay of three years in the island and examined a large number of cases. The following are his conclusions. The disease attacks children and may develop in any part of the body, but it has a preference for the face, lips, arms and genitalia. It is less frequently observed between the fingers and toes. The mucous membrane of the lips and the scalp are not exempt. All ages are liable to it, but after childhood it is less common. In adults it is rarely observed away from the soles and sometimes the hands. It is frequently confluent in children, but de Rochas never observed confluence in adults.

The early lesions of yaws consist of papules the size of a 20 centimes piece, denuded of epidermis. A serous fluid exudes from the surface, giving rise to a thick, yellow, parchment-like pellicle. Beneath this the surface is bright red, granular and spongy-looking, and except for a faint areola, the surrounding skin is normal. These lesions extend peripherally and coalesce, at the same time becoming more and more raised above the level of the skin. Others, again, only increase in height, looking like half a strawberry, blackberry, or raspberry.

At the angles of the lips and between the toes the lesions become ulcerated and depressed. The ulcerations always present a raised border.

Ulceration is not the usual termination of the disease. When ulceration does not occur, involution takes place without a scar, or at most the scarring is very superficial and ultimately disappears. On the other hand, the ulcerating process may be deep, leading to bad scarring such as is observed in severe burns. The toes or the adjacent parts of the buttocks about the anus may become adherent (*cul collé des indigènes*).

De Rochas also observed a goodly number of ulcers involving the bones, which the natives put down to the same cause, but as he had not seen the beginnings of these lesions he could not give a decided opinion about them. Moreover, the natives gave the name of tonga to all ulcers lasting any time.

The disease is sometimes fatal in children. All children between the ages of 1 and 10 are affected, and the disease attacks them more frequently than it does adults, and the latter more often than old people.

The disease is looked upon as contagious, and de Rochas saw a white man who considered he had contracted it as a result of dressing the wounds of an affected individual.

Tonga leads to enlargement of the lymphatic glands and exhibits features strikingly like syphilis. This may explain why some observers, as, for instance, D'Entrecasteaux, the navigator, have been misled. De Rochas considered it was impossible to admit that tonga was of the same nature as syphilis. The former was rife both where pox was very rarely seen and where it was common. Moreover, he added, the way in which it attacked everybody, especially children, was against such an idea.

With regard to adenitis, that of the groins is very common and often ends in a hideous ulcer occupying the whole of the inguinal region.

In another work which de Rochas published in 1862,[2] he refers to syphilis, stating that it was more or less rife on the coast, being very common in those places frequented by sailors, but rare in other parts. He added that tonga or yaws was rife both where lues venerea was very rare and where it was most common, children being particularly attacked by tonga. This, he considered, sufficed to differentiate it from syphilis. He thought that tonga took the place of small-pox among the natives, who were exempt from the latter disease.

It is generally admitted at the present day that yaws and syphilis are two different diseases.

I have examined histologically parangi lesions which were handed to me by the late Sir William Kynsey. They differed from the syphilitic granuloma in several respects.

In my opinion the frambœsial lesion is probably merely the result of secondary microbial invasion from without. This is borne out by the histological appearances which I have found, viz.: marked downgrowth of the epidermal interpapillary processes, accompanied by an imperfect development of the cells of the horny layers (parakeratosis) leading to the formation of a stratified crust, the component parts of which are held together by micrococci, leucocytes and exudation. This view receives confirmation also from the statement made by one observer, that if the primary papulo-necrotic eruptive elements be not subjected to irritation, they involute spontaneously.

[1] British Museum Press, mark 7373, c. 16.

[2] "*La Nouvelle Caledonie et ses habitants*," 1862, British Museum, 10492, a. 3.

Plague.

INDIA.—The deaths from plague in India during the week ending April 15th, numbered 51,786. In the Punjab and United Provinces the numbers were 23,942 and 15,884 respectively.

LEPROSY AND CHRISTIANITY.

By Arthur Neve, F.R.C.S.E., &c.
Hon. Superintendent, Kashmir State Leper Asylum.

I.

It was Mr. Jonathan Hutchinson who, in 1903, writing to the *Times*, bracketed the words {Leprosy / Christianity} with an etiological significance. At a subsequent meeting of the British Medical Association, an unusual number of experts being present, it was evident that the tribunal of medical opinion does not endorse Mr. Hutchinson's fish theory, and hence the alleged connection between Christianity and leprosy rests upon an unproven theory. It might have been expected that many missionaries would at once have answered charges published in such an influential journal, and one or two did so; but others felt that an opinion brought forward by one of Mr. Jonathan Hutchinson's formerly high professional reputation should be treated with respect, and required that a careful examination should be made into the facts, more especially those concerning India and the missions there.

The editor of *Medical Missions in India* (January, 1904) wrote: "Of course the explanation of the theory will at once occur to anyone who knows anything about mission work among lepers, that it is due to the large number of lepers who have become Christians, but it seems almost incredible that a scientific man with Mr. Hutchinson's reputation should have fallen into such an obvious fallacy." Yet, this is indeed what he has done. In the same journal I asked for a wide investigation of the following points.

(1) *Of the Christian inmates of asylums what number were Christians before they were lepers?*

It has been found that in Northern India less than 5 per cent. were Christians before they became lepers, and that only one or two cases could be found in the whole of Northern India in which adult converts a few years later became leprous.

The census report for 1901 states that "Manbhoom and the Santal Parganas show a much wider diffusion of leprosy than in 1891."

It is known that Christianity is making good headway among Santals, so it might be thought that here, at any rate, is an instance suggestive of connection. There are now some 18,000 Christian Santals, but what are the facts? The Rev. Dr. Campbell, a missionary of thirty-one years' experience, has never known of a Christian becoming a leper. Yet Manbhoom has 15·3 lepers per 10,000 of population. Evidently, then, this large and increasing number occurs among those who are non-Christians.

Again, Chota Nagpur may be quoted as an instance of simultaneous increase of Christianity and of leprosy, but on investigation we find that although there are 80,000 Christian kols in Chota Nagpur we can hear of none who are now lepers and were Christians before they were lepers. Mr. Hutchinson himself visited Purulia Asylum and it is very remarkable that he did not then discover two salient facts—

(*a*) That of the many (503) Christian inmates all became converts after they were lepers.

(*b*) That there are no Roman Catholics among the Christian lepers.

The Protestant missionary who has been superintendent of that asylum since 1886 and who has been a missionary for thirty-four years, states categorically: "I never had a Roman Catholic convert in the asylum. I know the Roman Catholic converts in the Ranchi district very well; I have travelled a great deal annually and have visited hundreds of villages in which there are Roman Catholic as well as other converts. Well, I do not remember having ever met with a leprous Roman Catholic."

To the same effect I have the written statements of Roman Catholic priests working in those districts, Khunti, Torpa, Ranchi, Mandar, Gumla, Sarwada and Katkahi, with an aggregate of 38,500 converts, and amongst them there are 7 lepers, *all of them leprous before baptism.*

Evidently in this district also any increase of the disease is among non-Christians.

In a recent tour through India from Kashmir to Ceylon I visited many missions and leper asylums, and made careful enquiries, with the result of ascertaining altogether less than six cases in which leprosy had developed subsequent to baptism as adults.

(2) *What percentage of Christian lepers are in asylums and what of Hindu lepers?*

Not more than 1 per cent. of Christian lepers live out of asylums, so that all Christians who are lepers are registered as such. It cannot be said with any certainty what percentage of non-Christian lepers are out of asylums. It would seem certain that there are at the present time less than 10,000 inmates in all the leper asylums in India, and that this does not represent *one-tenth* of the total number of lepers.

So that statistics of leprosy classed according to the religion of asylum inmates are very misleading. In fact, all the census statistics are unreliable for purposes of comparison, as has been pointed out by Sir Lepel Griffin, Mr. Wellesley Bailey and others.

We have no reliable evidence that leprosy is upon the increase. Any apparent spread since the census of 1891 probably indicates that the census in 1901 was more thoroughly taken.

When we consider these two points, we see that the actual incidence of leprosy among the Indian Christians, apart from those converted as lepers in asylums, is very far below the average for India. Taking Mr. Hutchinson's own instance, the Punjab, where there are 39,000 native Christians, apart from those actually converted in asylums, I can only discover one case of leprosy, which gives only ·25 per 10,000; or among 80,000 Christians in Chota Nagpur, deducting 7 adults known to be lepers when baptised, none have subsequently developed leprosy, = ·0 per 10,000.

Dr. T. M. Nair has effectively shown that as regards the Madras Presidency, Mr. Hutchinson makes a lamentable misstatement when he says: "The Indian Jain, who is a vegetarian, almost absolutely escapes leprosy, while the Catholic suffers fearfully."

In Madras there were 27,485 Jains, of whom 14 were lepers = 5 per 10,000, as against 4 per 10,000 among Christians, this last figure being certainly in excess, as I have shown above that many of the Christian lepers became lepers before conversion.

Brahmins also are, or should be, strict vegetarians,

but Dr. Nair has shown that among them also leprosy exists in the ratio of about 4 per 10,000.

There can be no illumination by shutting our eyes to the great facts of the case as regards India. In a general way it may be thus stated, that in India out of a total of about (or over) 100,000 lepers, not over[1] 800 were Christians when their disease first appeared; of these the great majority are Roman Catholics. It may be fairly asked, if the Roman Church is responsible for these 800, who is responsible for the remaining 99,200? Or what has the Roman church to do with the 100,000 lepers in China, or 100,000 in Japan?

Similar facts like those regarding the Salsette Christians will fall into their proper perspective when we are able to explain many other endemic instances not among Catholics, as, for example, 17 lepers on Minicoy (a ratio of 150 per 10,000) among Mohammedans, but there are four other islands in the Laccadives which are quite free from the disease.

As a matter merely of logic, it is difficult to follow Mr. Hutchinson. He attributes the "terrible sufferings" of the Catholics to the use of fish on *fast* days; but the only instances he adduces which can stand investigation are those of fishing populations which habitually eat fish *every* day of the week, as all their progenitors did, and as Indians of all religions all round the coast of the great peninsula or of Ceylon still do.

I hold no brief for the Romanists, but I maintain that it would be erroneous to assert that native Christians connected with the Roman Church eat more fish than the corresponding communities, whether low caste Hindus or Buddhist, or Animist from which the Christians originally came, or from among which they are still being recruited. In many inland parts it is certain that fish is a rare luxury and one not to be thought of on fast days.

Another thing, too, may be definitely asserted, both of Protestant and Romanist Christians, that their diet in 99 cases out of 100 remains quite unaltered. In the hundredth case, by means of better education, the social status is improved and a larger income is earned, so that the general conditions of life become more favourable. It may indeed be stated generally that the surroundings of Christian communities are less insanitary than those of their non-Christian neighbours and that they are far more amenable to the influences of Western civilisation, and that this is no unimportant matter in the prophylaxis of a disease like leprosy.

SOME NOTES ON THE FISH THEORY OF LEPROSY.

By Arthur Neve, F.R.C.S.E.

II.

In 1903 I was on special duty in the district around the Wular Lake in Kashmir. I then realised to what an extent fish is eaten by the people. In going through many villages I had to pick my way among fish laid out to dry amidst the filth of the village. The weather was damp and close, and the fish appeared to be all in a semi-decomposed state. In some villages fish-curers exposed them on a framework to the action of sun and air, and some of them were smoked, but hardly any salt was used, for it is extremely expensive in Kashmir.

The dried fish are sent into Srinagar, where they are largely consumed by Hindus and Mohammedans. Fresh fish and partly cured fish are largely eaten by the villagers and peasantry around the lake and the main streams flowing into it.

My duties brought me into close contact with thousands of people as I went from village to village, and hut to hut administering flood relief.

Here, then, was an ideal ground for leprosy *if the fish theory were true.* I found two cases of leprosy in the whole district. I subsequently examined the records of the State Leper Asylum for the ten years 1893 to 1903, and ascertained that a total of 8 lepers had been at various times received as leper patients coming from those districts, the whole population of which might be approximately estimated at 25,000. Probably, at no one time would it be possible to find more than six lepers in it.

Three short marches to the west, crossing a low pass, we come to the mountain valleys of Karnal, the upper parts of which are forests and steep grassy hillsides, while lower down there is a little maize cultivation scattered about the slopes. The people are herdsmen, and in the summer following their cattle they live in the rough sheds high up in the mountain pastures. Their staple food consists of coarsely-ground maize, made into unleavened cakes; with large quantities of curds and some buttermilk; occasionally also they get goats' flesh.

The total population of the various hamlets and encampments in the valley cannot exceed 2,000 or 3,000; but the number of lepers is large, very probably thirty, of whom a large proportion have been to the State Leper Asylum at some time or other.

There is no reason to suppose that these people ever eat fish; perhaps in autumn a few might be caught in pools as the streams get low. It would be their one chance in the year.

We endeavoured to make a map which should show the distribution of leprosy in the Western Himalayas.

Along the populous villages of the alluvium, or the fertile plateaux, there would be one case here, another there, at wide intervals; in upland hill-villages, or narrow side ravines, here and there a few cases, perhaps connected with one another, might cluster together, as in Karnal above described, or near Rajaori, or in Kishtiwar, where the conditions are very similar.

In my experience it is rare to find an absolutely isolated case of leprosy. On careful investigation it is usually found that some relation or neighbour has had the disease. This may be stated statistically, that the incidence of the disease among relations up to the second degree is about 5 per cent., while in the general population it is only about 4 per 10,000.

In the course of a prolonged recent tour through India, I have found a distinct consensus of opinion against the fish theory at places like Taran-Varan,

[1] Wellesley Bailey, Esq., says: "In our asylums we have 7,349 lepers, of these 3,153 are Christians; *our* Christian lepers are *practically all converts.*"

Dehra-doon, Mandla, Santalia, Purnlia, Calcutta, Madura, Neyoor, and Colombo.

It would take far too much space to enter into a discussion of the local reasons adduced. But a belief in some form of commensal contagion seems equally wide-spread, and is gaining ground.

There is at the present time a family in the Kashmir State Leper Asylum with the following history. When the youngest boy was a baby the father developed leprosy in a severe ulcerating form, and he died two years later.

About this time one after another of the four children developed tubercular leprosy, and last of all the mother in a very mild anæsthetic form. Fortunately, such cases are rare, but they throw light on the possibility of what looks like virulent contagion, though the possibility of another explanation cannot be overlooked.

The fact cannot be gainsaid that not only at Kashmir, but in many parts of the coast of India, there are fish-eating communities in which leprosy is comparatively rare; while there are other districts in which leprosy is abundant, but fish are rare.

Another consideration is that large quantities of cured or partly cured fish are transmitted into large towns such as Srinagar. Who consume this? Apparently, middle-class Hindus and Mohammedans, amongst whom leprosy is extremely rare.

So, too, Ceylon imports 295,000 cwt. of cured fish per annum. In such a climate much of this must speedily become tainted, but where is the leprosy caused thereby?

At Hendala Asylum, the finest and best managed I have seen anywhere, I made careful enquiries as to this.

It is generally felt in Indian asylums that Mr. Jonathan Hutchinson, acting on preconceived notions, has rejected as unreliable the witnesses against his theory; that there are few localities where any modification of the fish theory covers all the facts, and many places where it is in opposition to most of the facts.

"Thèse de Lyon," 1904.

Actinomycose de l'oreille (Actinomycosis of the Ear). By George Vielle.

The external ear is rarely affected, though sinuses may pass from the surface, and are often associated with œdema of the neck.

The middle ear may be invaded from the pharynx where the first symptoms are noticed, or it may be due to disease of the jaw. Middle-ear disease may be due to an invasion through a perforated membrane. The symptoms are those of a slow otitis media. Complications, as mastitis, rupture of the membrane, facial paralysis, caries, and meningo-encephalitis, are usual.

The diagnosis can only be made by microscopic examination of the pus. The prognosis is serious on account of the liability to complications.

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THE

Journal of Tropical Medicine

MAY 15, 1905.

LIVINGSTONE COLLEGE.

THE Principal of Livingstone College, Dr. Harford, has issued invitations for the Commemoration Day Proceedings at Livingstone College, Leyton, E., for the afternoon of Tuesday, May 23rd. The College exists for the purpose of giving instruction in the elements of medicine and surgery to men who are already missionaries or who are preparing to go forth as missionaries, mainly to isolated posts, and the larger number to tropical climates.

We can testify to the excellence of the work carried on at the College and hope to hear that the appeal for the small sum of £1,000, by May 23rd, will be responded to many times over. A cordial supporter of the College has promised £200 provided £1,000 can be raised by Commemoration Day, and of this sum £550 are still required.

The Livingstone College fulfils a valuable and unique function; it is the only institution in the world specially devoted to the training of missionaries in the elements of medicine and surgery. How necessary is this training it is needless to dwell upon and impossible to exaggerate the importance of. Missionaries' lives in tropical countries are passed in

regions, as a rule, far removed from the possibility of obtaining the services of medical men, especially in cases of sudden illness, either for themselves, their wives and children, or for the natives under their charge. It is for the purpose of teaching "first aid" in illness on a sound and scientific basis that the College exists, and very efficiently and thoroughly is this duty fulfilled. All who have any regard for the souls and bodies of their fellow-creatures must feel an interest in the work of the College, and we would urge all who can to apply to the Principal for admission cards to visit the College on May 23rd and personally become acquainted with the work being accomplished at this admirable institution.

WESTERN MEDICINE IN CHINA.

THE work of the various missionary societies in China in spreading the teaching of Western medicine amongst the Chinese has never been so active as now. The China Medical Missionary Association has recently devoted attention to the translation of several standard works into Chinese and, with the assistance of these, teaching has been much simplified, as many of the pupils are entirely ignorant of English. Dr. Philip R. Cousland, of Chao-chow-Fu, near Swatow, has translated Halliburton's "Handbook of Physiology" into Chinese, and the illustrations of the book have been executed by Chinese workmen in Shanghai.

We congratulate Dr. Cousland upon the completion of an ardous task which he has done admirably, and it is hoped that other medical works translated into Chinese will soon be ready for publication.

LONDON SCHOOL OF TROPICAL MEDICINE.

DINNER AT THE HOTEL CECIL, LONDON, ON MAY 10, 1905.

THE RIGHT HONOURABLE JOSEPH CHAMBERLAIN, M.P., IN THE CHAIR.

THE great gathering at the Hotel Cecil on May 10th, under the presidency of Mr. Chamberlain, was instrumental in raising a sum of over £10,000 on behalf of the funds of the London School of Tropical Medicine.

The Dinner Committee consisted of:—

Chairman—His Grace The Duke of Marlborough, K.G.; The Right Hon. Lord Brassey, K.C.B.; The Right Hon. Lord Strathcona, G.C.M.G.; Sir Donald Currie, G.C.M.G.; The Right Hon. Lord Rothschild, G.C.V.O.; Perceval A. Nairne, Esq.; Admiral Sir Richard Tracey, K.C.B.; Sir John Craggs, M.V.O.; Commander G. Hodgkinson, R.N.; Sir Patrick Manson, K.C.M.G., F.R.S.; H. J. Read, Esq.

Honorary Secretaries—Wm. Waldorf Astor, Esq., and Sir Ralph Moor, K.C.M.G.

The following were present at the dinner:—

Adam, A. Chivas; Adams, Walter; Adamson, A.; Adamson, W.; Alexander, Dr. Wm.; Anderson, Dr. John, C.I.E.; Andrews, General Avery D. (U.S.A.); Angier, Sir Theodore, V.C.; Annan, John; Arbuckle, The Hon. Sir Wm.; Armour, P. W.; Arnhold, H.; Arthur, Col. A. M.; Arthur, Sir George, Bart.; Aspinall, Algernon E.; Astley, Thurlow; Atkinson, Dr. T. R.

Baily, E. H.; Baker, F. Arnold; Baker, Dr. C. J.; Baker, Dr. Oswald; Baker, P. R. A.; Baker, T. S.; Balfour, Robert; Bardsley, Rev. S. Martyn; Barham, Lt.-Col.; Barham, Sir George; Barlow, Sir Thomas, Bart., K.C.V.O.; Barnes, Dr. Robert, F.R.C.P.; Barry, E.; Bartlett, Herbert H.; Baylys, —; Beaumont, Edgar; Belilios, The Hon. E. R., C.M.G.; Bell, R. Murray; Bellamy, C. V.; Benn, Ian Hamilton; Bennett, T. J., C.I.E.; Berrisford, P. A.; Biddell, W. R.; Bird, Claud; Bishop, Major A. Conway; Bisset, Col. Sir W., K.C.I.E.; Blanchard, Professor R.; Bois, Stanley; Boraston, John; Borer, A. J.; Boyce, Professor Rubert W.; Branfoot, Surg.-Gen. A. M., C.I.E.; Brash, J. M.; Breitmeyer, L.; Brett, Michael; Brightman, Charles C.; Brimacombe, Dr. R. W.; Brooke-Hitching, Sir Thomas; Brown, Dr. W. Carnegie; Bruce, Sir Chas., G.C.M.G.; Bulstrode, Dr. H. Timbrell; Burdett, Halford; Burdett, Sir Henry, K.C.B.; Burney, Herman K.; Burns, Hon. J. C.; Butler, F.; Butlin, H. T., F.R.C.S.; Buxton, Sir Thos. Fowell, Bart., G.C.M.G.; Byas, Edward H.

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Young, Sir Frederick, K.C.M.G. ; Young, Keith D. ; Young, Morgan H. ; Young, W. M.

After the loyal toasts had been drunk—

Mr. CHAMBERLAIN, in proposing "The London School of Tropical Medicine," said that he thought they would be inclined to agree with him that attendance at a great public banquet of that kind, or, at all events, any inordinate addition to such festivities, was really inconsistent with the position of advocate and supporter of preventive medicine ; but, although on that account he had felt bound to decline very numerous invitations from too hospitable friends, he could not resist the temptation to repeat the experience of six years ago, when he presided at a similar banquet, and when they established that school. Now he came back to them to rejoice in their past success, and to provide for their future. His interest in that great question was unexhausted, and, indeed, unabated. It was a privilege as well as a duty to be in any way associated with it. It was a privilege, because he could not himself think of any subject of scientific research and philanthropic enterprise which was more interesting, and it was a duty which we owed to the Empire from which we could not divest ourselves, whatever our political opinions might be. Although his own experience convinced him that in this country it was very possible to affix political stigma to the most incongruous questions, this work of mercy, at all events, would be an exception. However violently we might be opposed on political matters, we could join hands in this useful work. This duty had increased in recent years with the continual extension of our territory, with the increase of our scientific knowledge and our opportunity, and also with the awakening of our Imperial conscience. We owed this duty to the vast population for which we had gradually made ourselves responsible. We owed it still more to those of our own race who were daily risking health and life in order to maintain the honour and the interests of this country. Our territory expanded, and, although some time it must come to an end yet at present it had been unending. There were those who, no doubt, took exception to a particular policy, but, if they themselves were responsible, as perhaps they might be, they would find that there was something stronger than their will, that there was a destiny which drove us forward. Within the last half century Africa had been disclosed to the world, and, in what had been called the race for Africa, it was impossible that we should not have our share. Competition in what Lord Rosebery once called the pegging out of claims for territory and markets went on. He did not think that any one, even the most convinced little Englander, would feel that it was possible for his country to keep entirely out of the running.

BRITISH INFLUENCE AND ADMINISTRATION.

But there was an influence at work which drew us even further. We approached a new country.

We established a protectorate or a sphere of influence —which generally meant a sphere of no influence— and we thought we could stop there, we thought we could take the business up again when we pleased. In practice we found that that was impossible. Where the British flag was planted there must be established the British peace, and barbarous methods must be abolished, and law and order substituted for anarchy. We were unable, therefore, to stay where we began. Whatever the beginning, we must go on until something like rough justice and order had been introduced into the territory for which we were responsible. Hence many little wars, much to be regretted, but after all to be taken into consideration in connection with their result. The balance was a balance of good, and for one wrong that might have been committed enormous benefit had been conferred upon the people. Let them compare the position of Egypt as it was a quarter of a century ago with the Egypt of Lord Cromer (cheers), which was the envy for its prosperity of every country in the world. Let them look at the case, perhaps even more extraordinary, of the Sudan, or of Nigeria, a great empire of immense size and fertility and wealth, yet almost distracted by the existence of the slave trade, by the brutalities of petty tyrants, by the base superstition which prevailed, and under the wise control of men like Sir F. Lugard, Sir R. Moor, and he would add the name of Sir W. McGregor, whose country was very near to Nigeria, that country had made wonderful progress, and we could see no limit to the prosperity it could attain. (Cheers.) Lives of Britons had been lost there and considerable numbers of natives had been killed, but if they took every life lost in the whole series of those campaigns it would not approach to more than a fraction of the number of the native population that were destroyed every year before our advent. By whom had that work been done? These miracles had been wrought by a mere handful of men, mostly very young, brought suddenly into the presence of great responsibilities, having to deal with crises of administration, of disease, of savage aggression—every problem of statesmanship. They had risen to the occasion with a courage and a resolution and a resource which proved that we still had among us the children of those who had gone before, who had presided over the infancy of the Empire, and that they still possessed those ancient qualities which had made our nation great.

Disease and Climate.

If they were only a handful, they were the best. Did we not owe something too, we who remained at home, we who profited by their services? The worst conditions they had to meet were the new conditions of formerly unknown disease, conditions of climate which had always been so fatal to Europeans. In the progress of this great world discovery the pioneers had suffered from our ignorance of the new conditions they would have to face, and our inability to deal with them. Many of them had left their health and their lives behind them. It was true of the Tropics, as it was true of some of our temperate colonies, as Kipling said in his "Songs of the English":—

> "On the sand-drift, on the veldt side, in the fern scrub we lay,
> That our sons might follow after by the bones by the way,
> Follow after, follow after, we have watered the root,
> And the bud has come to blossom that ripens for fruit."

We knew that some of these sacrifices must be faced. It was a necessity of the part we had to play: but it would be pitiable, it would be shameful, if we allowed these sacrifices to grow for want of any preventive precautions upon our side. Our first duty was to do all that was in our power in order to reduce this blood tribute that we paid to the Empire, to reduce it to the uttermost. M. Pasteur, he supposed, laid the foundations for all the recent work of scientific research, and the work had been continued both abroad and at home by men whose names would be remembered among those of the greatest of our philanthropists and men of science. In connection with the work of dealing with tropical disease, we should never forget the names of Sir Patrick Manson, of Major Ross, of Leishman, and Professor Haffkine, and many others.

The Schools of Tropical Medicine.

He thought we owed first to Sir Patrick Manson the idea of a tropical school which should co-ordinate all this knowledge and give it practical effect. Almost abreast with him, if not before, came the promoters of the Liverpool School. There was room for all in that work. He was sure they entertained no jealousy; on the contrary, they welcomed the success of that competition, and they congratulated the Liverpool School on the success they had already achieved. There was only one thing he thought he envied them, and that was the liberality and the energy of their citizens. He wished that in every other institution such as that they could have a man as energetic, as devoted as Sir Alfred Jones. He wished they could have a community as generous as that of Liverpool had shown itself. They raised something like £40,000 by private subscriptions, and money still poured forth there whenever there was a sufficiently satisfactory subject for its expenditure. Why could not London, the metropolis of the Empire, the metropolis of the world's commerce, emulate more frequently the generosity of a provincial city? The London School was provided at a cost of £30,000, a considerable portion of which was provided by Government and Colonial assistance, some by private subscription, and some, unfortunately, had to be provided by loan. It held accommodation, in the first instance, for twenty students and six residents. Since that time the accommodation had been increased. Altogether 503 students had passed through the school, 233 sent by Government, 157 private students, fifty-nine foreign students, and fifty-four missionaries. That classification, and especially the last figures, would suggest how much devotion and unselfish zeal there was in those who went to those countries at all risks to themselves in order to give comfort and religious instruction to the inhabitants. We were still in the beginning of this enquiry and of these operations. The results in regard to malaria and yellow fever had been more than striking. Elephantiasis, sleeping sickness, beri-beri, and other plagues, which, though only become known to us in recent years, up to this

time had wrought havoc among the native populations in which they existed, were being investigated. For some of the expeditions sent out we had to thank private benefactors, otherwise they would have been impossible. They had to thank Sir J. Craggs, and they had to thank specially Mr. Bomanji Petit, a Parsee gentleman, who, with a munificence characteristic of his community, had contributed £7,000. Still more were they grateful to those who had taken part in these expeditions, not concealing from themselves what they involved. They were in many cases more dangerous than war, surely they were not less honourable. First, Mr. W. Myers, and now, recently, Dr. Dutton, both distinguished men of science, both given up to the pursuit of this research, had fallen victims to their unselfishness. They were true martyrs to science and to humanity. How should we honour their memory? What statues or monuments should we erect? Surely there could be no better expression of our feeling than to enable the work to which they gave their lives to be continued and extended. The London committee asked for the sum of £100,000, and, if he might make a comparison between London and Liverpool, it was a mere drop in the bucket in comparison with the Liverpool subscription. They asked for £100,000 to repay the debt, make a proper provision for the teaching in such a teaching institution as that; above all, to subsidise the research into these diseases of every kind. He confessed it seemed to him that there could not be a more desirable application of superfluous wealth than to enable that institution to unite the work of the investigator and the work of the physician, which was, after all, the ideal union between scientific enquiry and its practical application. He asked them to sympathise with those workers of our Empire who had already done so much to secure its renown, and who had contributed, and were contributing, to the happiness and welfare of the vast populations which we had governed together under the protecting influence of a single flag.

Sir Patrick Manson, in response to the toast, enumerated some of the more important work done by the School. He stated that over 500 students had taken out a course of study at the School since its foundation five years ago. The accommodation of the school had been doubled during the past twelve months, new laboratories and additional residental chambers having been added to meet the ever increasing demand for instruction in Tropical Medicine. Of the many scientific investigations undertaken by the school, Sir Patrick referred to the elucidation of the Mosquito-Malaria theory by an expedition to the Roman Campagna, and to the importation of malaria infected mosquitoes to this country causing malaria by their bites. Our knowledge of filariasis had also been advanced by Dr. G. C. Low, the Superintendent of the School, who, whilst a student at the School, recognised the embryo of the filaria embryo in the proboscis of the mosquito, and thereby confirmed, as far as it possibly can be, the well-rooted belief that the disease is caused by the direct introduction of the filaria parasite into the human being. In Uganda, Dr. Castellani, whilst engaged in the work of an expedition sent out under the auspices of the School, found the trypanosoma in the cerebro-spinal fluid of cases of sleeping sickness, and thereby laid the foundation of our knowledge of sleeping sickness. Sir Patrick cited several other important additions to our knowledge of Tropical Medicine made at the School and by students who have studied there, and maintained that the School has amply justified its establishment and the funds that have been placed at its disposal. Many questions remain to be dealt with, and all that was wanted was money whereby opportunity would be afforded to investigate the many scourges which were responsible for the suffering and untimely death of our fellow-subjects in many countries under the British flag.

The Right Hon. Alfred Lyttelton, the Secretary of State for the Colonies, said the Empire was held at a great sacrifice of British lives, and it was to reduce this blood-tribute that the Schools of Medicine in London and Liverpool were called into existence. A more noble work could not be conceived, and both Schools were nobly fulfilling their part in the work of the Empire. Although much had been done we were as yet only at the threshold of our task. To send men to take part in the government of certain of our Colonies had hitherto meant loss of health or of life, and it was with feelings of sorrow on many occasions that we parted with them to take up their duties in these Colonies, knowing well the dangers they were exposing themselves to. Every home-dweller in these islands benefited directly by the sacrifices made by these brave men, and the least we could do was to minimise the dangers they ran by contributing to a fund, the object of which was to investigate the nature of the diseases to which they were liable, and to thereby help to alleviate the evils which these diseases gave rise to.

Lord Strathcona, G.C.M.G., who responded to the toast of "The Empire," said that although Canada was far removed from the Tropics, it behoved all subjects of the King, wherever their lot was cast, to do what they could to ameliorate the sufferings of the Europeans and of the natives within the British dominions.

His Grace the Duke of Marlborough, K.G., proposed the toast of the Chairman, Mr. Chamberlain. In his official capacity as Under-Secretary of State for the Colonies he was in a position to state from intimate knowledge in how great esteem Mr. Chamberlain was held throughout the British over-sea dominions. Personally, he regarded it as a great privilege to have been associated with so eminent a statesman in the Colonial Office, and he hoped that Mr. Chamberlain would be spared for many years in health and vigour, so that he might have the satisfaction of forwarding the many problems of State which he had at heart.

"Rousskey Vratch," St. Petersburg, vol. ii., No. 48.

Retinal Hæmorrhages in Parasitic Anæmia. By A. S. Tchemolosoff.

Tchemolosoff describes six cases of anæmia and retinal hæmorrhages due to the presence of the *Ankylostomum duodenale*. All the patients thus affected died. A description of the microscopic examination of the eye of one patient is given.

EXTRACT FROM A LETTER WRITTEN TO AN OFFICER ON FIRST APPOINTMENT AS AN ASSISTANT RESIDENT BY A FORMER RESIDENT IN NORTHERN NIGERIA.

Tropical Outfit.

I shall be very pleased indeed if I can be of any use to you over outfit for Northern Nigeria, but do not suppose I can give you any more advice than Way and Co., who are well up in the needs of the country.

Men always take too much kit with them the first tour, and old stagers take very little, not because they buy there, but because everything is so rough that one can do with little; still, I am of opinion that kit amply repays one for the trouble in taking it out, especially if one has the luck to drop in for a pressure of work.

You can generally get the usual tinned stores at the Niger Company's Stores in the principal places (at about 20 per cent. on home prices). But you should certainly take out with you a box of provisions for the trip up river from Burutu to Lokoja. This takes seven days, but you should have enough food for fourteen to allow for waiting at Burutu, and for breakdowns.

You can get kettles and things there sometimes, but do not rely on getting any kit there.

You can get a list of kit recommended by the Colonial Office with their compulsory list, and I do not think you could do better than let Way and Co. buy for you what you decide to take, as they have outfitted most of the men who have gone there for the last two years.

I enclose a list of things I took myself, which, while perhaps you will think it too long, may give you an idea of what to take.

I enclose a copy of the contents of ration boxes Way and Co. supply, with a few notes in case you make them up yourself.

Also a note of stores I think I should take if I were going out again myself.

Also some notes on foodstuffs, and some on messing.

All baggage should be in 60lb. lots, as there is nothing but head carriage off the river. You can leave heavy things or cases of stores, &c., with the storekeeper at Lokoja.

The Colonial Office told me to take about £25 in gold, and this is sound so long as too much of it does not go in cards and things on the voyage out. You can generally draw some pay on arrival, and there is a very nice and useful allowance of 5s. a day coming in monthly.

Besides this, if your duties necessitate a horse, you get 2s. 6d. a day for that.

My advice generally to anyone going out to Northern Nigeria would be "go slow," and that would apply to everything.

Notes on Kit.

Pants, Singlets, Socks.—Thin wollen, two thick for voyage home; the uplands are very cold.

Collars and Cuffs for voyage, soft shirts worn there, boiled ones not recommended.

Pyjamas.—Twice as many as you use at home.

Cholera Belts.—Everyone pleases himself in these.

Mosquito Net.—Oblong top, not bell shape.

Mirror.—One 6in. by 9in. is a comfort.

Ground Sheet.—Take the thickest and biggest obtainable.

Blankets.—At least six, it is very cold on the uplands, cheap as possible, not white.

Rug.—Cheerful for quarters.

Mackintosh.—As strong as possible, when it rain you know it.

Rubber Boots to knee.

Sweater.—Take two at least.

Water Bottle.

Helmet.—There is a very good regulation pattern, you may take two, khaki and white.

Cap for night wear, never go out for a minute without helmet in daytime.

Belt.

White Canvas Boots can be bought at many places (Smith and Son, Derby Road, Nottingham) for 5s., quite good enough, take four pairs.

Strong Boots.

Spare Laces.

Dubbing, but you can get shea butter there.

Puttee Leggings.

Blanco costs 2d. a cake here, 6d. there.

Puttees.

Dark Goggles if sun troubles you.

Army Revolver.—0·450, with some dum-dums.

Saddle.—Any old one.

Lee-Metford Sporting Rifle, 0·303.

Basket with enamel ware, knives, &c., and all cooking utensils for two persons. Take as good a one as you care to.

Mincing Machine.—Small one, meat is so tough.

Hausa Grammar.

Trousers.—Nothing so cheap and lasting as khaki.

Dress Clothes.—If you like, the regulation dress is either that or the white Eton jacket, which is better.

Holland Jackets for office work.

Uniform.—There is a compulsory list which you can get from the Colonial Office.

Tools.—Serviceable ones.

Stencil.—With your name in one-inch letters, cheap and useful.

Tinder-box, Matches, Straps, Eel-line, Thread, Needles, and 1,001 things every man choses for himself.

Sheath Knife.—Small, but strong.

Lantern.—Small talc-sided folding, cost about 5s.

Lamp.—Lord's lamp, for kerosene is popular.

Old Clothes.—Especially old flannels and sporting things are immensely appreciated by the boys there.

Shirts.—Soft white canvas shirts, same as used here for tennis, are the regulation there, take four. Strong flannel ones are also a blessing all over the earth.

Medicines.—Please yourself, the necessary things are aperients and quinine, whichever form suits you best of each.

Compactum Bedstead, Camp Folding-table and Chair, Cheap Deck-chair, Canvas Bath.—On no account fail to take these.

Washstand or basin, but you can get an enamel basin at Burutu, which will do well enough.

Life Insurance.—I found the Royal Exchange the best office.

Notes on Stores that are Useful.

Suggestion for Four Cases. — Biscuits all useful, especially "Cabin Bread," which does in place of bread, the ordinary ship's biscuits, 30lb.; flour, 24lb.; vegetables, as cheap as can be got, 18lb,; coffee, 6lb.; tea, 6lb.; cocoa, Vi-cocoa is slightly stimulating, and, therefore, very useful when run down, 6lb.; rice, 6lb.; ground rice, 3lb.; macaroni, 3lb.; sago, 6lb.; tapioca, 6lb.; candles, 6lb.; crystallised sugar, hard, 6lb. Meat: Irish stew, stewed rabbit, rations, 18lb. Grease, lard or dripping, whichever is cheapest, there is no fat in the land, 24lb.; marmalade and jam, good for aperient, 24lb.; milk, Ideal or Viking brands, *not* sweetened, 24lb.; soap, 6lb.

All packed in as small tins as possible, for Tropics.

Notes on Foodstuffs to be Obtained there.

Chickens, the staple food, cost from 6d. to 1s., small, tasteless; guinea-fowl, ducks, and turkeys, get these when possible, better than chickens, a little dearer; meat, dear, tough, no fat in it; bananas, excellent cooked or raw, cheap; paw-paw, when ripe an excellent fruit, when unripe a good vegetable; fruits and vegetables, several kinds, make your boy look out for them in the markets; onions, the staple vegetable, the salvation of the country; fish, this is plentiful in the river, make your boy go early to market or arrange with fishermen for it, some taste muddy, some are boney, but some are first-class; eggs, plentiful; milk, can be obtained where there are the cow-Fulani—on the highlands; yam, ubiquitous vegetable, woolly, indigestible; sweet potato, more digestible than yam. Water: be very careful about this, drink distilled water and none other if near condenser; if not, boil and filter every drop; native-made foods, avoid all these, because they are nearly always made with bad water.

Notes on Messing, &c.

Coast Boys are expensive, do not know Hausa, are not popular with the other native servants.

God-palaver Boys.—Mission boys are not, as a rule, satisfactory, they too often despise their master, they seem to have lost much of the usual respect for the white men, either too much hypocrite or too simple to be much use (but see below).

Balarla.—Keep one, not for use, it is a pity to hurt your boys, but because the sight of it is wholesome to them.

Crockery.—Have this returned to the basket as soon as possible after every meal, keep the basket in your own room, under your eye, open so that you can see at a glance that all the things are there.

Table.—Let this be as simple as possible and as regular.

Stores.—These should be reserved as much as possible for emergency, eke out the foodstuffs obtainable with them.

Luxuries.—Everything is so undeveloped that these soon become more trouble than they are worth.

Boys.—The Chief of Police at Lokoja keeps a register of boys; if you have not got one before arrival there, go and see him at once; look out for a boy at Burutu, men often bring a boy down to that place with them when they go on leave; if you have not got one there, make great effort to get one at Onitsha; the Asaba boys are good ones, if you have time go and see whether the Roman Catholic Fathers at Onitsha can recommend one; their boys are not open to the objection to which other God-palaver boys are.

Extract from a Letter from an Officer in Northern Bomu.

I found such great help from the information which you (Way & Co). had gathered in your office, that you might care to have the result of my experience as regards kit. If length of time in trekking and canoeing, and variety of methods of transports (canoe, steamer, human carriers, oxen, donkeys, and camels) go for anything, I may claim to be an expert. I have also talked over kit and supplies with ever so many men, both my old stagers and "new chums" (of each of those classes a man has been my companion on the way up). To take your list of supplies *seriatim*:—

Compactum Bed, Willesden's Outfit, Linen. — Of course, all sound. The Government are issuing complete sets of tables, chairs, and washstands, but an extra set of one's own is most handy; the only points are that in the X-bath and washstand the ring fastenings *always* tear through, it would be much better to *stitch* the cloth loops on.

Brown Blankets.—Excellent.

Large Jaeger Sheets.—Too much praise cannot be given them; they are invaluable, especially up here, where we go to about 40° sometimes at night.

Travelling Bath, Ground Sheet, Kit Bag, Hammock Chair.—Quite good.

Lord's Lamp.—Excellent in its way, but should be backed up by a similarly made and fitted (*i.e.*, oil holder and tin) lamp half the size; the big one burnt too much oil, and is too big and liable to breakage for rough trekking—oil up here is some three months distant, and is a consideration. It would be sound if men brought out strong drums of kerosene oil; the ordinary thin tin ones supplied by the Niger Company do not stand trekking; *e.g.*, out of six tins we brought up, there is, I think, only *one* unpunctured one.

Berkefeld Pump Filter.—Excellent, of course; take also six extra cylinders. I strongly advise *also* a syphon filter, *i.e.*, a candle with long rubber tube (many spare tubes required), but the pump filter does its work quickly, of course; the other is slower.

Water Bottle.—The best one would be one which, when fitted, would weigh about 50lb., with a lockable tap, felt covered; often on the trek water-places are far distant one from the other.

Uniform Cases.—Your small ones are invaluable; just the right size and *weight*, and very strong.

Goggles.—Required.

Medicine Chest.—Large one, as fitted *by you* (not my assortment).

Saddle.—I find mine excellent.

Guns.—Good.

Cartridges.—Always saleable, if not required—very scarce here.

Sponges.—Three or four.

Jaeger Goods.—These, for comfort and warmth combined with coolness, if I may express it, are *excellent.*

Canteen Basket.—This is one point on which I am

absolutely certain of my ground. The Bucket canteen baskets are absolutely a mistake; this is not the opinion of myself only, but of everyone. What is required is a large, square, strong basket, with divisions and lock, into which the things (whether made of china, aluminium, or enamelled material) fit easily. The round canteen basket is worse than a Chinese puzzle, and no boy ever packs it until he has lost half the things; in the meantime the "overflows" are carried round in a box. I believe there are two men in the Protectorate who have succeeded in repacking a canteen basket, but I am not likely ever to qualify in this line. Also bring a couple of dozen large and small aluminium tumblers.

Norris' Boots.—Excellent.

Hicks' Goods.—Quite satisfactory. The *detachable* collar game, though, is a mistake; let all shirts have their collars. I reckon, even allowing for the washing here, that two dozen 2s. 6d. shirts will last a year. The bush shirts are really good, and men will find them quite sound.

Camera.—Yes, bring one. I bitterly regret not having done so. From all accounts, the "British Ensign" does not give satisfactory results in this light.

Provisions.—For men situated in outlying districts, one cannot bring out too much of the standard things—sugar, jam, and that kind of thing. One can always get meat and chickens there. It is impossible, however, to give any tips unless one knows where one is going: this much, though, one can always dispose of spare stores.

THE LIVERPOOL SCHOOL OF TROPICAL MEDICINE.

Death of Dr. Dutton.

It is with the deepest regret that we announce the sudden death of Dr. Dutton, Walter Myers Fellow, at Konongo, in the Congo, on February 27th, while actively engaged in the investigation of trypanosomiasis and tick fever. In 1903 Dr. Dutton, accompanied by Dr. Todd, proceeded to the Congo to investigate trypanosomiasis and other tropical diseases; towards the end of 1904 they had reached Stanley Falls and independently they were able to demonstrate the cause of tick fever in man, a discovery made a few weeks previously by Ross and Milne in the Uganda Protectorate.

Further, they were able to prove the transference of the disease from man to monkeys by means of a particular species of tick. During these investigations both observers contracted the disease. The last letter received from them was dated Konongo, February 9th, when they both appeared in excellent spirits and were on the return journey.

In the death of Dr. Dutton the Tropical School and the University has suffered the loss of its most brilliant graduate. Although only twenty-nine years old, he has already won a recognised position throughout the scientific world, and as recently as last October Professor Koch, in an address before the anniversary meeting of the Berlin Medical Society, exhorts all nations to lend assistance to the work of combating trypanosomiasis in man so successfully conducted by the expeditions under Bruce, Dutton and others. Educated at the King's School, Chester, he proceeded to the University of Liverpool, where he rapidly made his way, and in 1897 he was appointed to the George Holt Fellowship in Pathology, which gave him the opportunity for research. This fellowship, the first of its kind which was established in the University, has proved of the greatest service in encouraging research. Lieut. Christophers, I.M.S., now Director of the King Institute of Hygiene, Madras, held it in 1896; Dr. Annett, the present Lecturer in Comparative Pathology in the University and Superintendent of the Farm Station of the Liverpool Institute of Comparative Pathology, held it in 1895; and Dr. E. E. Glynn, the present Lecturer in Clinical Pathology, held it in 1899. Dr. Dutton entered the Royal Infirmary, where he acted as house surgeon to Professor Rushton Parker and house physician to Dr. Caton.

In 1901 he was elected to the Walter Myers Fellowship in the Tropical School. His first expedition to West Africa took place in 1900, when with Dr. Annett he visited Nigeria. Two reports were issued as the result of this expedition, one dealing with anti-malaria sanitation and the other consisting of one of the most complete monographs upon filariasis hitherto published. In 1901 he proceeded alone to the Gambia and drew up a most comprehensive and useful anti-malarial report which has proved of the greatest service to that Colony. It was during this expedition that he identified in the blood of a patient of Dr. Forde, the Medical Officer of Bathurst, a trypanosome, belonging to a group of animal parasites which had hitherto been only found in animals. He accurately described and named it. Subsequently he found the same organism in numerous other cases in the Gambia and elsewhere. It can hardly be doubted that this brilliant discovery of the first trypanosome in man by Dr. Dutton was an important factor in leading to the discovery of the cause of sleeping sickness, which was subsequently shown by other observers to be due to the same parasite. In addition to his discovery of *Trypanosoma gambiense*, he also described several other trypanosomes new to science.

In 1902 he proceeded with Dr. Todd to the Senegambia and drew up a report on sanitation, which was presented to the French Government, and further papers on trypanosomiasis were published. The present expedition to the Congo was sent out in 1903. Dr. Dutton was accompanied by Dr. Todd and Dr. Christy, the latter returning to England in June, 1904. It was evident by the letter which they sent to the Committee of the School that they had made many exceedingly valuable observations whilst tracing sleeping sickness along the river-banks and in their investigations upon the nature of tick fever and filariasis. It will be seen from this short account that, although only twenty-nine, Dr. Dutton has accomplished a vast amount and has advanced in a most striking manner our knowledge of medicine. Medical science has lost

one of its most promising and distinguished men. The city of Liverpool will mourn the loss of its most gifted student, and his colleagues in the University and the Royal Infirmary have lost one who, combined with a great intellect a charming personality which made him beloved by all.

Correspondence.

TO THE EDITOR OF THE "JOURNAL OF TROPICAL MEDICINE."

SIR,—In your issue of the 15th instant, just received, I observe that mention is made of an outbreak of beri-beri at Tura, in the Garo Hills, Assam, by Dr. Crozier. In giving a description of eighteen cases, we are told that "some appeared scarcely typical forms of the complaint, the majority afforded examples of signs and symptoms indistinguishable from beri-beri. The outbreak was first noticed in May, 1904."

As to the cases reported by Dr. Crozier, of the American Mission at Tura, I would desire to disagree with the last sentence about the cases being "first noticed in May, 1904." I was Civil Surgeon of the Garo Hills in 1897, and I have had the students of the mission under my medical care, and had three cases of a similar character as Dr. Crozier's, though not quite typical; a description of them is to be found in the pages of the *Indian Medical Gazette*, vol. xxxii., under the title "So-called Kala-azar of Assam." I enclose a reprint of the article for favour of perusal and early return, and would draw attention to pp. 10-12 for publication.

Yours truly,
G. H. FINK, Major I.M.S., M.R.C.S., L.S.A.

Reprinted from the *Indian Medical Gazette*, vol. xxxii. (Nos. 6, 7, and 8, June, July, and August, 1897).

THE SO-CALLED KALA-AZAR OF ASSAM.

By Surgeon-Major G. H. FINK, I.M.S.
Civil Surgeon Garo Hills District.

In page 7, para. 1. of his pamphlet, Giles says:—

"Now this epidemic affection of the nervous system presents not the least similarity with anything met with in Assam." Moreover, he asks us to compare these accounts (Wernick's and Pekelharing's) with Dr. Kynsey's pamphlet, p. 5, para. 26. "In the one disease," he says, "the prominent character is paresis, anæmia is an after and unessential complication; in the other, the leading symptom is anæmia, and no true paralysis ever occurs."

Although my experience of Assam is too brief to enable me to speak with the same authority on the subject as Giles, yet, during my short sojourn of about six months in the Garo Hills, the disease kala-azar has absorbed a great deal of my thought and attention, and I have met with these cases among Garo native Christians, which do not seem to bear out Giles's statement with regard to paresis. The three cases were in young Garos of 18, 19, and 20 years of age respectively. The medical history of all these cases, which I have carefully ascertained, was an attack of fever which preceded loss of sensation, which began in the toes, and spread gradually up the limbs. The most pronounced of these three cases (Makhal) is a thin, dark-skinned, spare lad, 5 ft. 4 in. in height, of fairly healthy appearance, clean looking and intelligent.

From his family history, it appears that his father died of kala-azar; his mother and a brother are living and healthy. His present illness began two years ago with fever; he says he had kala-azar, and that he also passed a number of small worms.

His present state shows him to be apparently healthy, except that he has slight hypertrophy of the spleen; his appetite is poor, but he is not anæmic, and he has partial loss of sensation as far as the knee-joints, particularly over the region of the peronei muscles; his gait is peculiar, not that of locomotor-ataxy which is so very characteristic, but his legs are somewhat wide apart in walking, inclined to be knock-kneed at the same time, whilst he drags his feet along, has great pains in the soles, and a tingling sensation as far as the ankles. Cramps are occasionally felt in the legs. His eyesight is good, urine normal, knee-jerk exaggerated. The other two cases (Modhan and Jangran Garoxians) also give a history of fever, preceding the partial loss of sensation, which at present only extends as far as the toes. Both appear to be healthy and in good condition, and say they never had kala-azar nor worms. Their spleens are slightly enlarged: but there is nothing peculiar in their gait.

Makhal, moreover, states that three years ago several cases similar in character to his occurred in the Baptist Mission compound, and there were enlarged spleens accompanying them.

The above cases certainly point to disturbance of the nervous system subsequent to attacks of fever, and not attended by anæmia.

I have seen several so-called cases of kala-azar in the Garo Hills, and the above three cases have no resemblance whatever to that disease, but certainly resemble cases of malarial fever and cachexia which I have witnessed in India, Burma, the Punjab, South Afghanistan and Beluchistan, and most nearly allied to the worst forms of malarial cachexia.

TO THE EDITOR OF THE "JOURNAL OF TROPICAL MEDICINE."

SIR,—In your Journal dated December 15th, 1904, Dr. Duprey of St. Lucia suggests that the marking of the tongue so often seen in ankylostomiasis is due to chewing Phan. Phan, I suppose, is similar to, if not identical with, Betel.

I have now a Chinaman under my care who is a native of China, has been in this country for four years, has never chewed Betel, but whose tongue had the marking spoken of. Examination of the stools showed the ova of ankylostomum. It is not argued, I believe, that the markings occur in every case of ankylostomiasis, but whenever I find the markings I look for the ova, and, so far, have never failed to find them.

It seems to me that the Chinaman I have mentioned proves that the markings are not due to the chewing of Phan or Betel.

Yours faithfully,
J. TERTIUS CLARKE.
March 28th, 1905. *District-Surgeon, Tehah, Assam, Lower Perah.*

Reviews.

VERB. SAP. On Going to West Africa, to Northern or Southern Nigeria, and to the Coasts. By Alan Field, F.R.G.S. Messrs. John Bale, Sons and Danielsson, Ltd., 83-91, Great Titchfield Street, London W. Illustrated. Pp. 166. Price 2s. 6d. 1905.

This book, Vol. I. of the "Verb. Sap." series, augurs well for the success of the attempt to supply information to intending travellers and emigrants to tropical colonies. Mr. Field, in his preface, states that "no literary merits are claimed for "Verb. Sap.," but the book is written in the spirit and style of a true and practical teacher, and no one who reads it can fail to remember the facts the author wishes to impress. Although practical details are the very keynote of the author's endeavour, the book is written in so attractive a style that even the general reader, who never contemplates visiting West Africa, will find it most fascinating. Those about to take up residence in the parts of West Africa "Verb. Sap." deals with will find the book not only indispensable to help them at the outset of their career, but if they are wise they will make the book their daily companion, referring to its pages when difficulties arise, be they of the nature of travel or household worries, diseases and how to prevent them, or in the recognition of the flora or fauna of their environment. No one is forgotten; the soldier, the merchant, the naturalist, the missionary, the nurse, the sportsman and the amateur gardener will each and all find what they want to guide them, from the making of household drinks to the shooting of big game. In addition to the contributions by Mr. Field, there are excellent chapters by Sir Harry Johnson "on Sport, Shot and Saddle"; on "The Languages of West Africa," by L. H. Nott; and "Notes on Mapping," by E. Reeves; "Postal," by a Postmaster-General; "Military," by Captain W. Wright, V.C.; Life Insurance, Trade Notes, &c. An excellent map and a full index complete a book which it is hoped will be made a compulsory part of the equipment by Government, mercantile or missionary authorities of every one of their nominees proceeding to West Africa.

Notes and News.

THE SUNFLOWER VICE. — Marcoa in *Archives Generales de Medicines* draws attention to the habit prevalent amongst the Russian peasantry of eating sunflower seeds. The seeds are bitten and the husks ejected with the saliva which has been found impregnated with bacilli of deleterious characters.

Large quantities of sunflower seeds have been sent to the Russian soldiers in Manchuria. Marcoa considers that the ensalivated husks tend to spread disease amongst the troops.

LEPROSY IN NEW YORK.—Dr. C. F. Roberts reports that there is no truth in the statement that there are 200 lepers walking about in New York city. Three cases of the disease only are known and they are isolated in Blackwell's Islands. Dr. Roberts has never seen a case of leprosy contracted in the United States.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Arch. für Schiffs-und Trop.-Hyg.," March, 1905.

De l'Œdème dans les Maladies tropicales (Œdema in Tropical Diseases). By Dr. R. Wurtz, Paris.

Dr. Wurtz specially states that his present remarks on intertropical œdemata apply only to those due to the dropsical infiltration of the subcutaneous connective tissue.

In many acute tropical diseases œdema is seen to be connected with varied and for the greater part ill-defined and still unknown causes. It is a symptom possessing a considerable semeiological value, although this does not apply equally to all cases. It is difficult to classify the œdemata of tropical diseases according to their pathogenesis, this latter being still full of obscurity. The order which we are about to follow will be determined by the importance of the *rôle* which this symptom plays in the different diseases in which it is observed.

In addition to the ordinary, and one might almost say common-place diseases which cause œdema in temperate climates, such as diseases of the heart, blood-vessels, kidneys, and nervous system, in hot countries there must be added other causes which produce œdema; there are the œdemata due to infectious diseases peculiar to intertropical regions, whether of microbic or of parasitic origin.

The diseases connected with œdema to be met with in hot countries may be classified as follows:—

(1) Those in which œdema constitutes a special symptom, such as the wet form of beri-beri, epidemic dropsy, and that curious affection known as calabar swellings.

(2) In other diseases œdema is seen as an epiphenomenon and as an accessory symptom; such as the œdemata of malaria, filariasis, verruga, and other microbic and parasitic infections.

Beri-beri.—Œdema, in the dropsical form of beri-beri, is the chief symptom. It generally begins in the feet and legs, over the ankles, and on the front of the tibiæ, or on the dorsum of the foot at the level of the metatarso-phalangeal articulations. The pretibial and perimalleolar œdemata are among the forms most frequently met with. It may remain limited to these regions, or on the other hand it may extend to the knees, thighs, scrotum and trunk, and the sternal region. The sacral region is often invaded. Œdema must always be sought for in this situation when absent from the other parts of the body. It is also

found in the lumbar regions and along the whole of the vertebral column. It is most often symmetrical, but may only be present on one side of the body, or in one limb, or in both unequally. It sometimes alternates, occupying one hand and the opposite foot. When œdema is general, the patient appears as if suffering from ordinary anasarca. In certain cases the invasion is very rapid, anasarca being established in forty-eight hours.

The œdema may sometimes be restricted to certain regions, such as the neck, the face, the thorax, &c.

In the limbs the œdema is most marked on their anterior aspect. It may stop laterally and not be found posteriorly, contrary to what is observed in the cardio-renal œdemata which are more prominent in the dependent parts. The predominance of œdema over the sacrum is therefore not due to the action of gravitation.

In the face the swelling is sometimes enormous, the eyelids being so greatly tumefied that the patient cannot keep his eyes open, but is obliged to separate the lids with his fingers.

The intensity and the consistence of the œdema are variable.

The progress of beri-beric dropsy presents this peculiarity, inasmuch as having appeared suddenly and extended rapidly, it also recedes equally quickly; but if it appeared gradually, it slowly disappears. Its mobility is one of its most remarkable characteristics. It sometimes happens that the patient on awaking finds that he has become dropsical during the night; and in hospitals the physician may sometimes observe that between two consecutive daily visits the body of a certain patient distended with anasarca has regained its normal shape and volume.

The œdema is sometimes accompanied by effusions into the serous cavities (ascites, hydrothorax, and hydropericardium), and by infiltration of the submucous cellular tissue (œdema of the glottis has sometimes required tracheotomy).

The nature of the beri-beric œdema is probably of nervous origin. It is a trophic disturbance as are also the cyanosis, the thickening of the skin more or less marked over the œdematous parts, the hyperhydrosis, and the different exanthemata which are observed in certain epidemics.

The cardiac origin of the œdema, which one might think of when recalling the frequency of heart troubles in beri-beri, does not tally with the localised character, the mobility, and the peculiar behaviour of the œdema in this affection.

Epidemic Dropsy.—In this disease the œdema is general; anasarca rapidly sets in, and may be preceded by prodromata (fever, diarrhœa, vomiting, &c.).

The œdema does not always commence in the feet and legs, but may begin with the hand and forearm.

When it begins with the feet it sometimes does not extend beyond the knees; but it may progressively invade the thighs, trunk, and the whole body generally. In certain cases it is most persistent even during convalescence, and may even reappear when the patient is about to be discharged from hospital.

Calabar Swellings.—English physicians have designated by this name certain localised œdemata which appear intermittently and without prodromata in certain regions of Africa, in the basin of the Congo, in the course of the Upper Congo, and especially at Brazzaville and at Lobreville.

This œdema is preceded by a deep-seated painful sensation at the spot where the swelling is about to appear. The region is tense, tumefied, and tender. The pain and swelling last for a various length of time and then disappear. These œdemata may spread to the hand and also to the limbs, the knees, and as high as the ears. They come and go, and reappear after a longer or shorter interval, either at the same spot or in some other part of the body. They may impair movements by the stiffness which they cause as well as by the actual pain.

The examination of the blood of persons attacked by these œdemata has as yet not revealed the presence of any parasite.

They are found in the geographical sphere of *Filaria loa.* Dr. Wurtz once had the opportunity of observing these painful and ambulatory swellings in a lady suffering from *Filaria loa*; the swellings were situated preferably on the wrists, the hands, or one of the fingers. The extraction of the parasite did not cause them to disappear; but as the œdema had sometimes occurred in the neighbourhood of both knees, it is possible that more than one parasite was present in the patient's connective tissue.

According to Manson these swellings are due to the irritation of the connective tissue caused by the parasite laying her eggs.

Œdemata appearing as an Epiphenomenon in Tropical Diseases.

Malarial cachexia is accompanied by a soft, depressible, and pale œdema; the swellings are generally multiple, and at first limited to the dependent parts, although they may afterwards become extended, and by their puffiness mask the emaciation of the cachectic patient. The skin may show tortuous veins or purpuric spots.

In malarial anæmia œdema is often to be met with over the malleoli, and in the severer forms it may be more extensive. Its onset is insidious and rapid, but it disappears equally quickly under the influence of quinine.

Hæmoglobinuric Bilious Fever.—The renal lesions which so frequently complicate this affection determine the œdemata and anasarca peculiar to nephritic cases.

Verruga.—In acute verruga one often sees œdema commencing over the malleoli, and thence extending to the legs, but it rarely becomes general. Odriozola considers that the œdema is due to the great anæmia which is one of the first symptoms of the acute form of verruga, not Carrion's disease.

Filariasis. — The lymphatic thrombosis is accompanied with œdema in adenolymphocele. Above the obliterated lymphatic trunk, generally on a level with the swollen glands, there is a soft and indolent tumefaction, without heat, and giving the finger the sensation of touching an indiarubber ball.

In *trypanosoma fevers* one of the characteristic symptoms is the periocular œdema of the eyelids, which is especially marked when the patient wakes up in the morning.

In *dengue* œdema of the hands and feet has been noted as a complication.

In *pellagra* the patches of vaso-motor paralysis are often accompanied by œdema.

In *chronic dysentery* patients in the last stage of cachexia may have œdema.

Lastly, œdema may be present in cases of nephritis which result as complications in pestilent diseases, such as *cholera, typhus exanthematicus*, and *relapsing fever*. J. E. N.

"Arch. für Schiffs-und Trop.-Hyg.," December, 1904.

Yellow Fever Mission, Brazil. By Drs. Otto and Neumann.

Twenty-four cases were seen, but only three before the fourth day. In the absence of bacteriological examination early albuminuria is the only basis of differential diagnosis; the characteristic odour of the patient, and tenderness over the bladder are aids.

Dr. Oswald Cruz has two thousand men under him at Rio de Janeiro engaged in destroying and preventing the breeding of mosquitoes.

The young Stegomyia, which bite during the day, are rarely infected; adults only bite at night.

When cases of yellow fever occur on board ship where Stegomyia exist, there is a risk of an outbreak of yellow fever for thirteen or fourteen days. T. P. P.

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EXCHANGES.

Annali di Medicina Navale. Annali d' Igiene Sperimentale Archiv für Schiffs u. Tropen Hygiene. Archives de Medicine Navale. Archives Russes de Pathologie, de Médec. Clinique et de Bacteriologie. Australasian Medical Gazette. Boletin de Medicina Naval. Boston Medical and Surgical Journal. Bristol Medico-Chirurgical Journal. British and Colonial Druggist. British Journal of Dermatology. British Medical Journal. Brooklyn Medical Journal. Caducée. Climate. Clinical Journal. Clinical Review. Giornale Medico del R. Esercito. Hong Kong Telegraph. Il Policlinico. Indian Medical Gazette. Indian Medical Record. Indian Public Health. Interstate Medical Journal. Jahresbericht. Janus. Journal of the Royal Army Medical Corps. Journal of Balneology and Climatology. Journal of Laryngology and Otology. Journal of the American Medical Association. La Grèce Médicale. Lancet. Liverpool Medico-Chirurgical Journal. Medical Brief. Medical Missionary Journal. Medical Record. Medical Review. Merck's Archives. New York Medical Journal. New York Post-Graduate. Pacific Medical Journal. Polyclinic. Public Health. Revista de Medicina Tropical. Revista Medica de S. Paulo. Sei-i-Kwai Medical Journal. The Hospital. The Northumberland and Durham Medical Journal. Transactions of the American Microscopical Society. Treatment. West India Committee Circular.

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Original Communications.

AN ENQUIRY INTO THE ETIOLOGY AND PATHOLOGY OF BERI-BERI.

By Hamilton Wright, M.D.(McGill).

Director of the Department for Medical Research, Federated Malay States.

Abstract No. I.

(From Vol. ii., No. 1, "Studies from Institute for Medical Research, Federated Malay States." Printed by authority of the Resident-General, F.M.S. Singapore: Kelly and Walsh, May, 1902.)

Probably there is no disease whose etiology is so much a matter of speculation as that of beri-beri. Certainly there is no disease whose literature when read leaves one in so great a state of mental confusion. Nitrogen starvation, pernicious anæmia, infected fish and raw fish diet; arsenical, carbon dioxide and miasmatic intoxication; bacterial and plasmodic infection, are amongst the many direct causes put forward to account for it. They are largely speculative or founded on superficial or one-sided observations. No one of them is generally accepted. Many of them may and ought to be excluded as chief pathogenic factors. There is no better field than the Malay Peninsula in which to investigate this disease. In it are gathered together members of nearly all Oriental peoples affected by the disorder.

When it is seen that one (the Chinese) alone of these several peoples furnishes the great majority of cases of beri-beri, while ranking only second in numbers, it is but natural to feel that by a simple process of comparison and exclusion the causative factor of beri-beri may be readily determined.

Geography of British Malaya.

The Malay Peninsula juts down from the south-eastern corner of Asia. That part of it which properly concerns us extends from about 6° 8′ to 1° 12′ north latitude. It thus lies wholly within the Tropic of Cancer.

The total area of this part of the Peninsula is about 34,259 square miles. Included in this area are the protected Malay States, composing a federation known as the Federated Malay States, representing the greater part of the square mileage (23,959 square miles) of the British portion of the Peninsula.

But there is, in addition, the colony of the Straits Settlements composed of Singapore island and city, Malacca, Penang, Province Wellesley and the Dindings, containing about 1,300 square miles; and Johore, containing about 9,000 square miles.

Geology and Mineralogy of the Peninsula.

The facts that most of those who suffer from beri-beri are tin miners, that disturbance of virgin soil is claimed by some to be potent in producing beri-beri, and that the question of arsenical poisoning has now been thrust into the discussion of the etiology of the disease, would seem to point to geological formations as having to do with beri-beri prevalence. Closer observation, however, annuls this conclusion; and arsenic, so frequently found in conjunction with tin and lead, and at one time supposed to play a part in beri-beri, has no etiological significance.

Meteorology and Climatology.

The direction of the monsoons appears to be a determining factor in outbreaks of beri-beri. In the Kwala Lumpor Gaol and other public institutions where the incipient signs of the disease may be at once observed, leads me to state that only a small percentage of cases contract the disease during the south-west monsoon. The returns of beri-beri during the latter are composed of cases of beri-beric residual paralysis which remain over from the previous monsoon and are readmitted, or of cases that have contracted the disease during the latter part of the north-east monsoon.

Classification of Beri-beri.

The older authorities classified beri-beri as (*a*) wet and dry, or (*b*) acute pernicious, hydro-atrophic, atrophic, rudimentary.

Neither of these classifications appears to be proper in view of the underlying pathological lesion in the central and peripheral nervous system and alimentary tract.

I propose to classify beri-beri as follows:—

Acute pernicious beri-beri, which is always fatal.

Acute beri-beri, which runs a course of from three to six weeks, leaving the patient paralysed.

Beri-beric residual paralysis, which persists after the specific virus has ceased to act.

Incubation Period of Beri-beri.

The incubation period of beri-beri is between ten and fifteen days, although extreme paralysis and the other fuller effects of the virus may not manifest themselves till some days after the first demonstrable symptom of nerve lesion.

Racial Characteristics and Incidence of Beri-beri.

Europeans.

Beri-beri is almost unknown amongst Europeans, no matter what their social status; one or two authenticated cases only have occurred in the Malay Peninsula during the last ten years.

Eurasians.

In his dietetic habit the Eurasian is Malay, Chinese, or Indian, in inverse ratio to the purity of his European blood. Beri-beri prevailed to the extent of only 0·005 per mille. amongst Eurasians, compared with 118·236 in Chinese.

Malays.

Careful enquiries have failed to elicit, except rarely, the history or any evidence of the presence of beri-beri amongst Malays living in their natural environment. The swollen feet (*kaki bengkak*) noticed amongst the Malay population is an œdema due to simple anæmia following malaria, for in none of these cases were the cardinal nervous symptoms of beri-beri found. It would appear that the Malays, who live largely upon rice, vegetables, curried fish and fowl, and occasionally mutton, as a body escape beri-

beri, because of the absence of some dietetic factor that obtains with the susceptible Chinese; for in the Kwala Lumpor Gaol it was found that in their own chosen diet cooked by one of themselves the Malays developed beri-beri in a larger proportional percentage than either the Chinese or Tamils.

The Tamils.

Beri-beri is really uncommon amongst the Tamil community whilst they live under their usual condition of life, but when placed in an infected area such as the Kwala Lumpor Gaol the Tamils suffer proportionately to the Chinese or other inmates. Still more remarkable is it that beri-beri occurs in epidemic form amongst Tamils in India, but in British Malaya they enjoy a marked freedom from the disease when compared with the Chinese. The rice eaten by the Tamil is almost invariably prepared *a la* Bengal in Penang.

The Chinese.

Out of a total population of 1,250,844 in the portion of the Malay Peninsula under discussion, 581,672 are Chinese. (This estimate was made in 1902.)

The dietetic habit of the Chinese coolie is generous up to his means; compared to the lowest class of labourers in Europe they are well fed. The rice is either from Siam or Rangoon; with his rice the coolie takes vegetables grown in the Chinese way, and top-dressed chiefly with human excrement; salt fish, preserved locally; fresh fish on rare occasions; pork is largely eaten, and on his frequent fête-days, dried fowl. The Chinese coolie rarely, if ever, eats curry or other highly seasoned foods. He is a total abstainer as regards alcohol, but he is as a rule an opium-smoker. It is not the opium-smoker, however, who contracts beri-beri as a rule. The Chinese are the greatest sufferers from beri-beri, amounting to no less than 213·862 per mille. of the Colonial and Federal population. The Straits-born Chinese who represent the higher class of the Chinese communities are an exception. They are not wholly exempt, but there is some factor in their usual social and other habits that renders them more immune than other classes.

The great majority of the Chinese who contract beri-beri are the Sinkhehs or contract immigrants. If sent to the old mining grounds where beri-beri is present the disease may be contracted by the new-comer almost at once; if to a new mining ground where beri-beri is severe and widespread the new-comer contracts the disease in from a week to several months, depending on the prevalent monsoon.

Amongst the Orientals assembled in the Malay Peninsula the Chinese, not the tin miners only, but the Chinese generally, almost exclusively contract beri-beri. In the Kwala Lumpor Gaol all classes of the Chinese, the contract labourers, the older immigrants, and the Straits-born Chinese, amongst whom the disease is almost unknown outside the Gaol, developed beri-beri in almost equal proportions. This cannot be accounted for by a faulty diet or any other hypothesis than association in a building infected by some specific organism.

Incidence of Beri-beri in regard to Sex.

Male Europeans and Eurasians very rarely contract beri-beri; females never. Amongst the Malay community beri-beri is no respecter of sex. Chinese females are subject to the disease, but in the Malay Peninsula it is only the better class Chinese who bring their wives. On the whole we may conclude that females of the different races are susceptible to beri-beri to the degree to which they live under the conditions that induce it in males. It is not improbable that, given females in the tin mines or institutions where beri-beri is endemic, they would contract the disease equally with the males.

Incidence of Beri-beri in regard to Age.

Infants and adolescents are rarely attacked by beri-beri; but in the Malay Peninsula children make up a relatively small number of the total population, the majority of which consists of unmarried Chinese and Tamils. Amongst Malays—the natives to the country—the number of children under ten years of age attacked by beri-beri count for nothing in this particular question. Of 1,200 cases of beri-beri personally observed it would appear that the second and third decades are those of greatest susceptibility.

Incidence of Beri-beri in regard to Locality and Altitude.

Locality.

There is scarcely a tin mine in the length and breadth of the country that has not at some time been scourged with acute pernicious beri-beri; there are a few where the disease is now seldom seen; there is not one where the disease is never seen. In recently opened mines such as Bentong and Sungei Lembing the disease is widespread, severe, and largely fatal. In the older mines, where a large majority of the coolies have had acute beri-beri, from which they have apparently wholly recovered or have had more or less severe beri-beri residual paralysis for years, the disease would appear to be rarer.

The kind of mining, whether surface working or in deep excavations, has no relation to the number of cases of beri-beri. Workers in tunnels with sunken shafts are not prone to beri-beri.

Beri-beri is proportionately as severe amongst workers in gold mines as in those who work in tin mines.

In institutions, of which the Kwala Lumpor Gaol stands as an example, the disease when once established seems to defy all efforts to eradicate it.

On the sugar and other estates, although beri-beri is not endemic, short, sharp epidemic outbreaks of the disease occur amongst the Chinese.

Altitude.

Beri-beri in the Malay Peninsula is apparently a disease of the lowlands. The majority of people seldom live at altitudes much over 1,000 feet; but at the Sempan tin mine, where work is carried on by Chinese and Malays at altitudes ranging from 700 or 800 to 4,200 feet, no freshly developed cases of beri-beri ever occurred.

In fishing villages along the coasts beri-beri is

unknown; it would seem, therefore, that the process of curing fish is not capable of infecting with the specific organism of the disease. It is noticeable that the further the Malay population is removed from centres of civilisation the less beri-beri is seen in it.

Discussion of the Foregoing in their Relation to Beri-beri.

(*a*) Can it be positively shown that any of the above outlined local conditions are factors in the production of beri-beri? Geographically the Peninsula is in the beri-beri belt, and so far as beri-beri of Asia and Australasia is concerned it is centrally situated. It is also on the great highway of disease, and since the great influx of Chinese and Tamils began it has proved to be a more or less fine soil for the seeds of plague and dysentery, as well as beri-beri.

(*b*) That there is any geological condition that governs the beri-beri rate does not seem likely. The Peninsula is outside the volcanic belt, and is not troubled by seismic disturbance. So that it is beyond the action of Fierbig's theory that the operation of an assumed gas forming specific organism is closely related to the curve of activity of seismic and volcanic disturbance.

(*c*) It cannot either be believed that the geological formation favours the residence of a specific organism which operates effectively when the earth is disturbed; for beri-beri has not been and is not at present a disease of the agricultural classes either Malay or Chinese. No mineral poison can be regarded for a moment as the cause of beri-beri. This applies with force to arsenic. Looked at from any point there are compelling facts against a view that the cause of beri-beri is influenced by any geological factor.

(*d*) When meteorological conditions are examined it has to be granted at once that they and the specific factor of beri-beri are in some manner related.

(*e*) Temperature alone does not appear to operate, for here it is fairly uniform. There is, however, much ground for believing that the north-east rather than the south-west monsoon contains some element which favours the operation of the specific cause of beri-beri. The rainfall is greater and the general humidity higher during the former than the latter. It is probable that these favour the effective action of the beri-beri virus as they appear to do in Japan and the islands of Australasia.

(*f*) Altitude appears to have a definite bearing on the causation of the disease. Beri-beri is not seen in high altitudes here; only in the low, moist valleys. The disease, too, appears to be a place disease. Into institutions and kongsies which never receive the action of direct sunlight the disease is introduced and there it holds more or less complete sway for years, in spite of all efforts to eradicate it. The reason of this is to be found in the action of a specific organism that operates on persons in close association, as will appear later. That the disease is sharply circumscribed to shaded, damp foci, is, I think, due to the fact that the organism is of low vitality and quickly destroyed by the action of direct sunlight.

(*g*) It will be recognised by the casual observer that in the differences in the dietetic and other habits of the various races here, there is a vast opportunity for speculation as to the cause of beri-beri, and as to why one race (the Chinese) should be so prone to the disease, while other Oriental races (Malays, Tamils and other Indians) largely escape it.

(*h*) For instance, one has only to assume that the direct cause of beri-beri is due to a specific organism which gains entrance to the body through the skin, and that oiling the latter effectually excludes it. On this assumption it could be argued that the vast majority of the Tamils of British Malaya escape beri-beri because of their habitual oil-bath, and that the Chinese suffer severely because they do not take an oil-bath. Such an assumption is trivial in view of the fact that Tamils and Telegus have suffered from severe epidemics of beri-beri in their native habitat where the habit it is assumed protects them here must be more strictly in vogue. In the Madras Presidency there is to-day a focus of endemic beri-beri.

(*i*) Further, one might assume that beri-beri is due to a specific organism that developes on growing rice, and that Tamils who escape the disease do so because by their method of preparing their rice the organism is destroyed, and that Chinese, on the other hand, contract the disease because they eat rice not so prepared. Dr. L. Braddon, the State Surgeon of Negri Sembilan, is a strong advocate of this theory, and he brings forward many locally observed facts to support his view. But they are entirely thrown out by a wider experience of beri-beri. For instance, in Rangoon the Tamils, Telegus and Chinese eat the same rice as eaten by Chinese here, yet the Tamils and Telegues furnish 90 per cent. of the cases of beri-beri, while the Chinese altogether escape.

(*j*) If it is at once recognised that all these races are susceptible to beri-beri, and have at one time or another had it either epidemically or endemically in their natural habitat, no theory will for a moment be based on differences in racial habits, but a special cause will be sought, which may and does often act generally on a whole community, irrespective of sex, race, age, occupation, dietetic and other habits.

(*k*) It seemed to me that if one were given a focus in which beri-beri had been long epidemic or endemic, where regulations in the matter of sleep, work, diet and personal hygiene could be uniformly applied to a mixed party of Malays, Chinese, Tamils and other Orientals, it might readily be determined what etiological theory of beri-beri best fitted the facts. With the above conditions guaranteed, it seemed to me possible that many of the theories put forward to account for beri-beri could be excluded, and the question at least is narrowed to a working hypothesis that would be generally accepted.

Various Theories of the Causation of Beri-beri.

The theories most often advanced are as follows:—

(1) Gelpke's theory that beri-beri is due to dried fish infected by a trichina.

(2) Miura's theory that it is due to the ingestion of certain kinds of raw fish, principally the Scombridæ.

(3) Grimm's theory that it is due to the ingestion of infected fish.

(4) Takaki's and others' theory that it is due to a

pathogenic diet in which the proportion of nitrogen to carbon is too small.

(5) Ross's theory that it is due to arsenical poisoning.

(6) The theory that it is due to the ingestion of mouldy rice.

(7) Braddon's theory that it is due to the ingestion of a specific organism which developes on growing rice.

(8) Manson's theory that it is due to a place germ (earth, floor or house) which distils a toxin, volatile or otherwise, that, being inhaled or ingested, produces the disease.

(2) Glögner's theory that it is due to a hæmic plasmodium.

(10) My own conclusion that it is due to a specific organism that remains dormant in certain localities, but having gained entrance to the body by the mouth it multiplies locally (in the stomach or duodenum chiefly), gives rise to a local lesion and produces a toxin that, gaining the general circulation, acts on the peripheral terminations of both afferent and efferent ordinary and vital neurones to cause a bilateral symmetrical atrophy, and that finally the organism escapes in the fæces, to again lie dormant in places.

Discussion of the Various Theories.

Theories Nos. 1, 2 and 3 are absolutely eliminated, because during the eight months from May 3rd, 1901, to January 1st, 1902, not an ounce of fish of any description entered into the diet of the 49 prisoners who up to that time contracted beri-beri. Twelve of the 49 were incarcerated during June, July and August, *i.e.*, after the diet was instituted, and contracted beri-beri in September, October, November and December, *i.e.*, between four and five months after incarceration. With the short incubation period of beri-beri there can be no question of the 49 having contracted the disease from their diet before admission to the gaol.

Theory No. 4 is as effectively eliminated, for the diet contained a proportion of 1 N. to 12 C.; the physiological requirement being 1 N. to 15 C. The prisoners had the benefit of this highly nitrogenised diet for eight months, during the first four of which but few cases of beri-beri occurred, but during the latter four of which many cases occurred. If the extra nitrogen in the diet could have prevented the disease it should have done so most surely after the prisoners had had the benefit of it for four months. That there was little beri-beri during the four months following the institution of the high grade diet means nothing; for it has long been noted in the Kwala Lumpor Gaol that comparatively few cases occur from May to September. The onset of beri-beri during and after September and its subsidence in February and March after the high grade diet was abolished (January 1st, 1902) is conclusive evidence that it is wholly independent of the proportion of N. and C.

Theory No. 5 is eliminated, because arsenic in any shape or form did not occur in the gaol either before or during the eleven months' observation. There was no disturbance of soil, no tinned fruits, meats or vegetables used, and no sugar that might have been contaminated with arsenic. It would be absurd to suppose that all of the 90 cases that originated had arsenic in their systems when incarcerated, the effects of which were exhibited in from ten days to eighteen months after. It should be remembered in this connection that not a member of Party No. 3 contracted beri-beri, although it was exposed to extramural influences as well as to intramural conditions similar to Parties Nos. 1, 2 and 4, except in the matter of sleeping.

Theory No. 6, that beri-beri is due to mouldy rice, is wholly discountenanced by the fact that the prison rice was free of mould, and that all latent mould spores or mould toxins were destroyed by the process of steaming to which the rice was subjected (para. 286).

Theory No. 7 is wholly discredited for similar reasons. He will be a bold and badly informed theoriser who contends that the Siam or Rangoon rice of the Gaol held an active specific organism or toxin after being steamed for two hours under two atmospheres of pressure. Braddon's theory is founded on an assumption pure and simple (para. 225), supported by one-sided evidence which falls to the ground in the face of the single incontrovertible fact that 90 cases of beri-beri occurred when the Siam rice used was sterile.

Theory No. 8, that there is a specific germ, appears from my observations here to be true. But there is no evidence to support that part of this theory which assumes the distillation of a volatile poison and its inhalation or ingestion. The entire escape of Party No. 3, let alone Party No. 4, would be most unlikely in the presence of a volatile poison that caused some 90 original cases in one part of the Gaol compound and over 100 cases of paralytic relapse in another part.

Theory No. 9 has no foundation in fact. A thorough blood examination of beri-berics in all stages of the disease has not disclosed a plasmodium that could be associated with the disease as either its direct or indirect causative factor. Where plasmodia have been found they have belonged to one of the well-known malarial types.

Theory No. 10 is the only one that fits all the facts of the case. It holds good for the beri-beri of institutions and other communities. Unfortunately the specific organism has to be assumed. But granting its existence, the early symptoms of acute pernicious and acute beri-beri and the *post-mortem* appearances of the pylorus and duodenum in the former (*see* Obs. 3) declare conclusively that it enters the body *viâ* the mouth, multiplies locally in the stomach and duodenum, and produces a toxin that is absorbed into the systemic circulation to act bilaterally and symmetrically as a poison on the peripheral terminations of the afferent and efferent ordinary and vital neurones.

The elimination of theories from 1 to 10 is completed by the results obtained in observations on monkeys incarcerated in the infected Gaol.

(*To be continued.*)

Dr. A. Yale Massey, formerly of Benguella, West Africa, has been appointed Medical Officer to the Tanganyika Concessions, Central Africa.

NOTE UPON A CASE OF HÆMATURIA.

By Arthur F. Cole,
C.M.S. Hospital Ningpo, China.

A woman, age 40 to 45, was admitted on February 27th, 1905, to the C.M.S. Hospital, Ningpo.

On examination she was found to be suffering from general œdema of slight degree, ascites, liver enlarged downwards 4 inches below costal margin in nipple line, spleen about 2 inches below ribs, considerable anæmia and slight icterus; her cardiac sounds and measurements suggested hypertrophy of left ventricle; no murmurs present. The urine was evidently blood-tinged, but the woman said she had never noticed anything peculiar herself; she gave three years as the history of her illness' commencement. She was very breathless, owing to an attack of subacute bronchitis, in addition to her other embarrassments.

Catheter Specimen of Urine.—Sp. gr. 1020, reaction acid, presence of red blood corpuscles, vast quantities of leucocytes and numbers of granular renal casts, and in addition certain circular parasites, which may have been associated as a causative agent with the cystitis and nephritis.

Fæces were examined and were not found to contain anything to note in the direction of ova.

Whilst examining urine with 1/6″ objective I was astonished to see a circular body suddenly split up, and extrude a circular embryo. The urine was not centrifugalised.

Description of Capsule.—Apparently smaller than the embryo which I had seen emerge with a bound from it, and which lay touching it. Diameter 33 μ, roughly circular if split portions were placed in opposition; it seemed to be covered with minute prickles, but otherwise transparent, the split extended to about two-thirds of diameter of capsule.

Description of Embryo.—Diameter 45 μ, perfectly circular, measurement taken ten minutes after extrusion. Divided into clear outer zone surrounding inner darker area evidently embryonic, somewhat ovoid in form; the width of this zone varied from 10 μ to 6 μ in this first observed specimen. The differentiation of the inner dark portion is evident, and it seems to consist of an elongated central body with numerous globular protuberances with the appearance of columnar epithelium. Thus the *central* portion would measure about 35 μ × 40 μ.

Every embryo seen was absolutely circular and nothing in the way of terminal spines or oval bodies seen. Measurements of those found on three successive occasions in catheter drawn urine were as follows: 45, 42, 50, 42, 40, 35, 35, 50, &c.

The average was about 43 μ circular. Seeing the interest taken in her excreta, patient became fearful of her safety and decamped after thirteen days in hospital.

"New York Medical Journal," March 4, 1905.

Adenoids amongst Negroes.

Scheppegrell in an editorial draws attention to the fact that in the United States of America adenoids are met with amongst negroes, though proportionately less frequently than in white people. In the negro of the purer African type the total number of cases of adenoids met with amount to about 6½ per cent. of the whole.

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THE

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June 1, 1905.

REPORT OF THE SEAMEN'S HOSPITAL SOCIETY FOR 1905.

The authorities of the Seamen's Hospital Society of London have so identified themselves with the teaching and furtherance of tropical medicine that the annual report of the work done at their hospitals and dispensaries is of interest to all residents in the Tropics. No society, public institution, or hospital board in the kingdom appeals more directly to our sympathy, for to the sailor is extended a regard and romantic interest such as no other class of the community commands. The old wooden walls have given place to boats of steel, the flowing sail has been supplanted by machinery and its attended inconvenience of furnace and smoke, but the sailor himself remains to us, somewhat more conventional and unromantic, perhaps, than in olden days, yet by his occupation does he commend himself to our regard in health and our sympathy in sick-

ness. It was as long ago as 1817 that a fund was collected in London to found a hospital for seamen, and in 1821 a permanent floating hospital was established in the Thames at Greenwich. At first the *Grampus*, a 50-gun ship, was utilised for hospital purposes, but increased accommodation had to be found, and the *Dreadnought*, a 104-gun ship, was substituted in 1830. After twenty-seven years' service the *Dreadnought* was replaced by the *Caledonia*, but as the institution had become known as the Dreadnought Hospital the Society thought it wise that the new ship should be re-baptised, and the name "Dreadnought" was continued to its successor the *Caledonia*. Ships, however, were never intended for permanent hospitals, and the Society did wisely when, laying aside sentiment, they resolved to build a permanent hospital on shore. In 1870 the Infirmary of the Greenwich Hospital was handed over to the Seamen's Hospital Society on a ninety-nine years' lease, and the good work, begun in 1817, is being continued and expanded. The largest hospital of the Society at Greenwich contains 225 beds, and to this day it is known from old time associations as the "Dreadnought" Hospital. At the Victoria and Albert Docks, on the north side of the Thames, is the Branch Hospital of the Society with fifty beds, and to this Hospital is attached the London School of Tropical Medicine. Besides the Hospitals there are two Dispensaries for Seamen, one at the East and West India Docks, and the other at Gravesend. At these several institutions sailors of every race, colour and creed are received, nor are they discharged, as in other hospitals, until not only the malady is relieved, but until health and strength are completely restored. The cosmopolitan character of the Society and the universality of its usefulness have been acknowledged by every civilised country and by almost all the monarchs and governments of Christendom. It seems well-nigh impossible to believe in this maritime nation that the following statement should be permitted to be possible: "£21,000 at least will be needed to carry on the work of providing for the 25,000 sick and injured sailors and others who, it is estimated, will apply for relief during 1905, and of this sum not more than £5,000 can be looked upon as assured income. The Committee, therefore, invite contributions towards the £16,000 required. They desire to point out how comparatively few bequests are made to the Dreadnought."

In the interests of the sailors of all nations, we hope this appeal will be quickly and amply responded to, and that a Society which deserves so well of the country will not be allowed to fail in its usefulness for the paltry sum of a few thousands of pounds.

PLAGUE AT LEITH.

An outbreak of plague at Leith, occurred between May 5th and 10th, when four persons, the father, the mother, and two of their children, aged 6 and 3, were found to be infected. The symptoms were in the first instance attributed to enteric fever, then to typhus, and it was not until a bubo developed and a bacteriological investigation was held that the true nature of the illness was ascertained. The father, a labourer on a train line, was the first to be seized. The mother, a worker in a rag store, showed symptoms of illness, and she is alleged to have stated that she saw two dead rats in the premises in which she worked. The rags are reported to have been "clean," and no rats have been found infected with plague in the premises in which she worked, nor anywhere else in Leith. There is no clue to the source of infection, although it is considered that the arrival of ships from Eastern ports and from Hamburg may have had to do with the outbreak. The order of admission into hospital was first the father, May 5th; the child of 3, May 8th; the mother and child of 6, on May 10th.

Unusual precautionary measures were adopted. Contacts were isolated, rats searched for and examined, the clothing and tenement disinfected, and the outbreak notified to foreign governments.

HEALTH OFFICER'S REPORT ON THE PORT OF LONDON.

Dr. Herbert Williams, Medical Officer of Health for the Port of London, in his report for 1904, states that in the ships arriving at Gravesend:—

(1) Cholera. No cases met with.

(2) Yellow fever. No cases.

(3) Plague. One case in a vessel from a port on the River Plate. The man recovered after two injections of Haffkine's anti-plague serum.

TUBERCULOSIS IN MEN AND CATTLE.

THE vexed question of the relation between tuberculosis in man and in animals remains still unsolved. Koch, as is well known, is of opinion that tuberculosis in man is essentially different from that in cattle, whilst Behring maintains that both forms of tuberculosis are identical, and that the poison is introduced into the body by milk, and gains access to the system by way of the intestines. Kitasato supports Koch's contention, and advances in favour of his belief the following statements:—

(1) Tuberculosis in man has existed for centuries in Japan, whereas the disease in cattle was unknown in Japan until about thirty years ago, when foreign cattle were imported and introduced the disease.

(2) Inoculation of animals with human tuberculosis has always proved negative.

(3) Milk is seldom consumed in Japan; so that Behring's contention that milk is the chief cause of tubercular infection is an erroneous conclusion.

In China tuberculosis is widespread amongst human beings, but the number of cattle in China are few comparatively, and milk is shunned as an article of diet for both infants and adults.

Kitasato's first argument that tuberculosis amongst cattle was unknown in Japan until about thirty years ago, when foreign cattle were imported, will hardly be an accurate scientific test, as previous to thirty years ago no one in Japan was in a position to test the truth of the statement, and it was only about thirty years ago that attention to this subject was first directed in Europe.

UNIVERSITY OF LONDON.

WE publish the following notice by request:—

Dr. George Oliver will lecture in the Physiological Laboratory, University of London, South Kensington, S.W., on Monday, June 5th, at 5 p.m., on "Hæmomanometry in Man."

Admission to the lecture is free. Students of any school of the University and medical men will be admitted on presentation of their cards.

COLONIAL CIVIL SERVICE.

MR. EDWARD A. SAVAGE has been selected for the office of Collector of Customs, Shipping Master, and Inspector of Invoices of Jamaica in place of Mr. A. W. Hitchins, who has retired from the Service owing to ill-health. Mr Savage entered the Customs Department of Jamaica in 1873, and six years later became a First-class Clerk. He was subsequently made a Second-class Collector of Taxes for the Parish of St. Mary, a position he now relinquishes in favour of Mr. J. L. Lord, who is a First-class Assistant Collector stationed at Linstead.

Mr. F. A. D. Eves, Second-class Assistant Collector of Revenue, Jamaica, succeeds Mr. J. L. Lord as First-class Assistant Collector at Linstead.

Dr. Luigi Camilleri, Magistrate of Judicial Police for the Island Gozo, has been transferred to Malta in a similar capacity in place of Dr. P. F. Azzopardi, who will retire from the Service on April 1st. Dr. A. Mercieca succeeds Dr. Camilleri in Gozo.

Dr. P. Cremona, Senior Magistrate of Gozo, is also to retire on April 1st. Dr. G. B. Mifsud will be transferred from Malta to Gozo as his successor.

Mr. H. G. Hume Henderson has been made Acting Inspector-General of Police in the East Africa Protectorate in place of Captain J. C. H. McCaskill, who has arrived in England on leave.

Mr. Duncan S. Robertson has been appointed Harbour Master for the Port of Monckton, New Brunswick.

Mr. Ernest P. S. Roupell, who has been acting as a Second-class Clerk in the Colonial Office, Downing Street, for the past two years, is to succeed as Assistant Secretary to the Government of Malta Mr. F. C. Fuller, who proceeds to the Gold Coast as Chief Commissioner of Ashanti. Mr. Roupell was for several years connected with the West African Service, and held the offices of Consular Agent of the Oil Rivers Protectorate, Commissioner of the Brass River Division of Southern Nigeria, and Assistant Commissioner of the Anglo-German Boundary Commission. He took part in the Benin River Expedition of 1894 and the Ashanti Expedition of 1900-1901, for which he received the Distinguished Service Order.

Mr. A. R. Slater is acting as Second Assistant Colonial Secretary of Ceylon until his departure from the Colony on leave.

Mr. C. E. Herbert, who has represented the Northern Territory of South Australia in the House of Assembly for some time past, succeeds Mr. C. J. Dashwood as Government Resident and Judge of the Northern Territory.

The office of Registrar-General of Ceylon has been raised from the Second to the First-class Division of the Civil Service of that Colony, and the staff is to be augmented.

In consequence of recent changes in the Police Department of Ceylon, it is stated that Major R. E. Firminger is to retire on pension from the position of Superintendent of the Colombo Convict Establishment, and that Major de Winton, the present Inspector-General of Police and Prisons, will take over the combined offices of Inspector-General of Prisons and Superintendent of the Convict Establishment.

Mr. S. J. Waddell has been appointed Deputy-Collector of Inland Revenue at Truro, Nova Scotia.

Mr. F. Bartlett, District Judge, Negombo, Ceylon, has been made Assistant at Nuwara Eliya to the Government Agent of the Central Province.

Mr. W. T. Hargreaves, Resident Magistrate, Elliotdale, Cape Colony, has been transferred to the district of Lebodi, in place of the late Mr. J. C. Garner, and Mr. W. B. Gordon, who has been on temporary pension, re-enters the Service as Resident Magistrate of Elliotdale.

Mr. Herbert F. Blaine, Attorney-General of the Orange River Colony, is acting as Attorney-General

of the Transvaal during the absence on leave of Sir Richard Solomon.

Mr. W. Cousins has been appointed a Police Magistrate in and for the Province of Manitoba, Canada.

Mr. R. S. Duff Tytler, Superintendent of Immigration, Ceylon, has retired from the Service.

Mr. W. F. Wright, Collector of Customs, Mossel Bay, Cape Colony, is to succeed Mr. W. C. Noble as Chairman of the Harbour Board at that port.

Dr. H. A. L. Noble,-Medical Officer of the Uganda Protectorate, has arrived in England on leave of absence.

Mr. F. Robert is acting as a District and Stipendiary Magistrate of Mauritius during the absence on leave of Mr. H. Avice, and has been assigned the District of Black River and Plaines Wilhems, in addition to the Magistracy for the Lesser Dependencies.

Dr. G. P. Campbell is to succeed Dr. J. P. Berrie as District Medical Officer for St. David's District of St. Thomas, Jamaica.

Correspondence.

Croton and Castor Oil Seeds.

Sir,—As there seems to be a little confusion as to the points of diagnosis between the croton seeds and castor oil seeds and their respective composition, I feel it is just as well to know something about them before making any mistakes in their respective characters and action, and I therefore beg their early publication in your columns.

Croton Tiglium, known also as

(*a*) Jamálgota... ... ... Hindi and Gujerati.
(*b*) Jaypal ... ... Bengalee.
(*c*) Nervalam ... ... Tamil.
(*d*) Naypalum... ... ... Telegu.
(*e*) Cudelavancu and Neervaula ... ... Malayalum.

Both the seeds and oil expressed are highly poisonous. Inhaling the dust even from these seeds will produce pain and collapse, but no purging—this is possible when traders send large quantities of this seed in bags, or a mixture of castor oil seed with croton seeds.

Severe symptoms might attend cases of inhalation of the dust, or partaking of the husk or chaff of the seed in certain cases of idiosyncrasy. In these cases it is no crucial test to merely examine the seed and diagnose the castor oil from croton oil seeds (*Croton Tiglium*).

The seeds of the following resemble croton oil seeds in appearance and property, namely:—

(*a*) *Baliospermum montanum*, which are often sold by traders as Jamálgota and accepted by druggists.

(*b*) *Croton oblongifolium*, known also as

Baragach ... ... Bengalee.
Ganasm ... ... Gujerati.
Gonsurmy ... ... Goanese.

The crucial test between the oils of the above and castor oil is that the latter is soluble in glacial acetic acid, and in alcohol. It is completely soluble in four volumes of spirits of wine at 15° C. This diagnostic featureis very necessary to apply medico-legally when cases of poisoning occur, and it will generally be found that the castor oil seeds have been mistaken in identity, unless the embryo of the castor is decomposed, and, being mixed in the same way as any of the above-named seeds resembling *Croton Tiglium*, have absorbed the activity of croton oil which is due to crotonoleic acid (which is not the same as crotonic acid) present in the oil, both free and as a glyceride. Croton oil, besides, contains tiglic or tiglinic acid—isomeric, with angelic acid (C_5 H_8 O_2). There is also isocrotonic acid present in croton oil, which, shows the same chemical behaviour as crotonic acid. They come under the unsaturated acids (C_n $H_{2n-2}O_2$)

Castor oil seeds resemble croton seeds and another castor oil seed of a reddish colour with brown patches (much used for industrial purposes). Ricinoleic acid is obtained from castor oil—its effect in the oil is purgative, and enhanced by the biliary secretions, and, in certain cases of idiosyncrasy, produces violent inflammation. Other symptoms might occur, but, as a rule, they are due to adulteration of the seed or as above mentioned.

G. H. Fink, Major I.M.S., M.R.C.S., L.S.A.
12, *Fairfax Road, Bedford Park, W.*

Cancer in the Tropics.

Sir,—The subject of cancer and its relative prevalence in temperate and tropical regions respectively is one of very great interest and importance, since it enables those interested in the disease to either uphold their contention as to the various causes at work, and thus focus the germ or parasite or whatever be the *causa vera*, and be guided strictly by statistics of value in all research.

I have been interested in cancer for the last three or four years, and previous to that, in malaria and tropical ulcer and "bursatee" in the horse in India. I enclose a cutting which gives my views on the points I have all along contended, and which were placed before the India Office previous to the publication of my *brochure* on "Cancer and Precancerous Changes, their Origin and Treatment," from which the cutting was taken. The reason for my placing my views before the Secretary of State for India (Lord George Hamilton) before publishing my work was that, as a member of the Indian Medical Service, I might timely awaken interest in the subjects of malaria and cancer from a research point of view. I am glad that I did so, as it has evoked an earnest desire to ascertain its prevalence in India among the various people of its different provinces, and so far fulfilled a good object.

From Fink's "Cancer and Precancerous Changes, their Origin and Treatment." xvii., p. 32.

"*Malaria, Delhi Sore, 'Bursatee,' and Rodent Ulcer or Cancer.*—It is necessary to mention certain points of interest on the subject of malaria and certain ulcers found in man and the horse in India which bear resemblance to rodent cancer.

"Some authorities have lately drawn attention to an antagonism between malaria and cancer, and that they bear an inverse ratio to one another in their prevalence. These points have brought forth a suggestion that persons be inoculated with malaria to protect them from cancer.

"Malaria and cancer might be considered antagonistic to one another; but it is by no means logical or scientific to conclude that the one would protect a person from the other if inoculated. In the matter of their bearing an inverse ratio to one another in their prevalence, the explanation is to be sought for in the peculiar influence of climate in these respective diseases; also the surroundings, habits, and race peculiarities present, which have doubtless a voice in their production respectively.

"The one disease is peculiar to tropical, the other to temperate regions. Disease, like plant and animal life, flourishes in particular regions, either tropical or temperate, where the conditions for the life of the parasitic forms are most favourable and the pabula sufficient and suitable for their life and reproductive changes.

"I have no desire to discourage the suggestion made of inoculating man with malarial fever to protect him from cancer, nor to affirm that this method of treatment is injurious or free from benefit. I merely wish to point out that it is not based on facts and observations from a scientific point of view, but purely empirical and wanting in scientific proof, since there are no data present to base such views upon.

"In India, it will be observed, where malarial fever occurs, there, skin diseases and entozoa will also be found to prevail. The more virulent the type of malaria the worse the forms of skin disease and entozoa as regards obstinacy to treatment and expulsion from the body.

"Regarding the suggestion of malarial inoculation for cancer, it has not been shown that Europeans who suffer from malarial fever are immune against cancer."

I find that my contention in my monograph on cancer to the India Office, and my *brochure* above mentioned, are supported by the JOURNAL OF TROPICAL MEDICINE and the *Indian Medical Gazette*, and as I am in as strong a position, if not stronger, than I ever was in my declarations as to the origin of cancer, which is based, not on mere theory, but on facts, I feel I must draw attention to certain matters already published in your Journal, and in the *British Medical Journal*, which support my views as to the relative prevalence of cancer in tropical and temperate regions respectively.

We are told, in the JOURNAL OF TROPICAL MEDICINE for March 1st, 1905, that carcinoma and sarcoma are difficult to diagnose and determine by clinical methods, and that microscopic examinations are but occasionally possible in districts remote from medical centres. It is probable, we are further told, "that sarcoma, although rare in the Tropics, is yet more commonly met with than is carcinoma, but neither the one nor the other occurs excepting occasionally, and it would seem as though malignant diseases, like some other ailments, diminish in frequency as the Equator is approached from the north." That Journal further informs us of the absence or rarity of cancer among the natives of the African continent; but in St. Helena and Mauritius cases of carcinoma are reported, some three or four cases yearly in a population of 3,000 to 4,000, and this is accounted for because of the "heterogeneous or mixed population" (whatever that means), as you do not define what their origin is, and as you doubtless will see the necessity of being more exact after reading my subsequent remarks, and after perusal of the statistics from the *Indian Medical Gazette* for May, 1902, extracted from the *British Medical Journal* of June 28th, 1902.

Then, again, your Journal's reports from Asia "are said to be meagre"; no cancer in Wei-hai-wei; but in Ceylon the number of cases is about 220 annually. Sarcoma is said to be more uncommon in Ceylon than carcinoma. It is subtropical.

In Australasian reports, we learn from the same Journal, that the aborigines in Queensland and in the islands of the Pacific do not suffer from "malignant disease" (a term bequeathed to us, I regret to say, from the days when the influence of *malign spirits* reigned in the minds of the ignorant in cases of small pox and scarlet fever epidemics, which were supposed to be due to these phantom causes), and "only one case of cancer," we are told, "occurred in British New Guinea."

As to the West Indies, cancer is said not to be so common as in England, in Grenada, Leeward Islands, and British Honduras.

Your Journal then asks the questions:—

(1) "Do British emigrants resident in Crown Colonies suffer more or less from malignant disease" (again this unfortunate term is used) "than do people resident in Britain?"

(2) "Does the half-caste population suffer from the disease more than do either their white or coloured co-residents, and have mixed populations, whatever the parentage, a tendency to the disease?"

(3) "There is some evidence that Eurasians suffer from malignant diseases to a greater extent than do pure-bred natives, and that white people in the Tropics are less likely to be attacked than are their relatives at home." Unfortunately the third point which I have separated under (3) is a continuation in your Journal of (2) and a continuation which might mislead scientific investigators.

Before publishing the statistics from the pages of the *British Medical Journal* to show the nature of (2) and (3) from the point of a scientific enquiry, I think it is well to abandon the term "malignant," for the reasons I have given in the above with regard to "malign spirits" and their connection with small pox and scarlet fever in severe epidemic form in the minds of some. Then with regard to the term as applied to sarcoma and carcinoma, I have felt that it were better to adhere to the nomenclature medically, since the one disease microscopically and by age incidence has been quite settled by the profession as being apart from one another. Sarcoma is connected with young people under 30 years of age, and is a neoplasm or growth from connective tissues, as the pictures depict under the microscope; carcinoma, in people over that age, and more so at middle life, and is cellular in origin, rapid epithelial proliferation with rapid degeneration and necrosis in the centre of the growth with rapid erosion at the periphery. I feel it is highly essential that we should be clear on all points connected with sarcoma and carcinoma differentially to be in a position to prove what carcinoma is, and its origin.

Before commenting or answering the queries in your Journal, let us turn to the statistics published in the pages of the *British Medical Journal* for June 28th, 1902, which are by no means meagre, and are said to have been extracted from the *Indian Medical Gazette*. It differentiates sarcoma from carcinoma, and also the varieties of cancer from each other, and from rodent cancer or ulcer.

Turning to para. 2, we learn that the percentage of cases in proportion to the total admissions occurring in the different races, carcinoma and sarcoma are more frequently met with in Hindus (1·98 and 0·67 per cent. respectively). Next come Europeans, with 1·16 and 0·89, and lastly Eurasians with 0·34 and 0·05 per cent. respectively. It is also stated that it was not found possible to classify the Hindus according to the different castes; but that Brahmins do undoubtedly suffer from cancer and other forms of "malignant disease" (here again this objectionable term) not at all rarely. These maintain what I have said before with regard to cancer in India in my *brochure* above quoted, that the low-caste Hindus suffer more from this disease than the high caste, and that sarcoma is more common than carcinoma. As to Brahmins suffering from cancer, there can be no doubt that they do in some cases, and other forms of "malignant disease," not at all rarely; but there are several divisions among Brahmins, some of whom are allowed to eat flesh, to smoke, and to indulge in alcohol. When the term "Brahmin" is used, it applies to all those of the priest caste; but it does not say whether they are "Gaur" Brahmins, "Kanaujias," or what set of Brahmin—Bhattarcharga's book gives them all,

Then with regard to your remarks on Eurasians suffering more from malignant disease and to a greater extent than pure-bred natives, they certainly appear to do so in the Crown Colonies as compared with India, and it is necessary to sift the evidence before us, and ask two more questions in addition to those you have already put, namely:—

(5) Are the "half-caste" population in the British colonies and the "mixed populations" considered Eurasians or pure-bred natives? If the former, then, according to your statistics above given, the answer is from your own statements that "there is evidence that Eurasians suffer from malignant diseases to a greater extent than do pure-bred natives"; but if the latter, then your own statement classifies them among "pure-bred natives," which apparently the *British Medical Journal* and the *Indian Medical Gazette* do; hence their immunity like the pure-bred natives from cancer. Your statistics from this point of view bring them nearer to Europeans.

(6) Does every mixed people claim to be an Eurasian, and cannot some Eurasians claim to be Europeans? To this I would say that every native of whatever country or origin can claim naturalisation if he choose; but if he choose to don a billy-cock hat and a pair of patent leather shoes, he

comes short of the requirements of the laws of naturalisation. Some pure-bred natives have endeavoured to claim their right to the exchange compensation allowance given to Europeans in India on the ground of naturalisation, and I believe it was strongly contested at the India Office. But Eurasians who by birth, standard of living, education and social status, are entitled to the same privileges and advantages, as they share in disease also with their European brethren, I think, ought to be distinctly classified in your Journal for the sake of a clear definition as to whether they suffer more from poverty and degradation, because some are inclined to thrust them down to a lower scale than Nature has intended them to occupy, and which they only desire to place before you in the interests of science and the human race, not because they have been doubtfully classified elsewhere, but unfortunately in the tropical hothouse of the JOURNAL OF TROPICAL MEDICINE. Are they more fit to be phyto or zooparasites?

I think that Mr. Chamberlain deals more considerately and kindly with his aërial and terrestial orchids at Highbury, with every due consideration to their respective and individual wants as to temperature, moisture, water, &c. One of the greatest of writers has told us that, in order to attain to the highest qualities of people, you must strive to aim at seeing the highest advantages of the class system of classification and not the caste system. The one has no colour or creed, the other is all colour and creed; the one uplifts without distinction of race, and dwells only upon the central power which distinguishes man from the brute creation; the other drives man downwards, and believes in his transmigration to the animal. The one possesses brain as well as soul, the other strives to cultivate brain without a soul. He then said: "I have done, my part is concluded, take it and examine it with all the enlightened powers of a just, honourable and truthful assembly. Other things will fade and perish, but truth and justice must flourish immortal even after this globe be burnt to ashes. 'Twere better to have cremation than incrimination."

Before I can bring before you every evidence in support of my theory of cancer, its origin and treatment, which are based on certain facts and not "the baseless fabric of a vision," I ask you to take and examine my remarks and see whether they are strictly true and just, and serve what is intended for scientific purposes, and towards an end which we all as medical men strive for and wish our fellowmen to strive after in the interests of the human race and family, for the uplifting of mankind by the class system of classification and not the downtrodden influences of caste.

I would ask publication of this letter in the truest interests of science and for the abandonment of terms which are as degrading as outcast, and which savour more of malign spirits than of medicine and its grand mission. "Conquer by love and by truth is our motto."

Believe me, yours very truly,
G. H. FINK, Major I.M.S., M.R.C.S., L.S.A.

"L'Echo Médical du Nord," February 26, 1905.

Treatment of Tropical Sore. F. Malméjac. From experience at Biskra the author finds the best local treatment is boiled distilled water at a temperature of 60° C. (140° F.). When crusts are present a stream of water is directed on to them, especially into the edges and cracks. A dry antiseptic dressing is then applied. The sores are dressed twice a day for a week; the crusts usually separate in two or three days. At the end of a week only one dressing a day is required. T. P. B.

Reviews.

HINTS TO NURSES ON TROPICAL FEVERS. By S. F. Pollard, Sister, Army Nursing Service Reserve; late Sister at Guy's Hospital. London: The Scientific Press, Limited, 28 and 29, Southampton Street, Strand. 1905. Pp. 57. Price 1s. 6d. net.

For the department of nursing dealing with tropical ailments it is advisable—in fact, necessary—to have a special text-book. Sister Pollard has supplied the requisite information in a book entitled "Hints to Nurses on Tropical Fevers." Of the ten chapters into which the book is divided, one that will be scanned very closely by nurses preparing to go abroad for the first time, is the opening chapter on "Hints on Going Abroad." The maximum of necessities it is evidently Sister Pollard's intention to give, and it is perhaps well to do so; the nurse, however, with a slender purse must not be discouraged if she cannot afford to get all the things mentioned as advantageous to her comfort on starting for abroad. In Chapter II. the nurse will find a condensed and readily understood account of the symptoms, prophylaxis, and the treatment of malaria. Still more important, from the nursing point of view, is the chapter on dysentery, for this disease calls for the closest attention and the utmost skill on the part of the nurse. The signs and symptoms of liver abscess are given in Chapter IV., and the instructions to the nurse, what she is to observe and what to record, are excellent. Chapter V. deals with cholera; and Chapters VI., VII., and VIII. are devoted to bubonic plague, beri-beri and yellow fever respectively. The chapter on Malta fever will have special significance for nurses taking up duty on the Mediterranean littoral. The last chapter is devoted to dengue, prickly heat, and typho-malaria. It will be seen from this brief summary of the contents that all the serious ailments the nurse is likely to meet with in warm climates are described and commented upon. With this book not only can the nurse become acquainted with the technicalities of nursing required in tropical diseases, but the information is conveyed in language so lucid and terse that the several diseases, their cause, their signs and symptoms, the means of arresting their spread, as well as an explanation of their rational treatment, can be readily understood To all persons also with families in the tropics this excellent book will commend itself, and should find a large and ready sale amongst them.

"Revista Medica de S. Paulo," February 15, 1905.

Tubercle and Ankylostomiasis. A. Mendonca. Of 800 patients admitted to hospital, 56 (7 per cent.) had tubercle, 147 (18·37 per cent.) had ankylostomiasis. The fæces of all patients are examined. The treatment consists in 6 grammes (ʒiss.) of thymol in six capsules, the dose being given three times at weekly intervals. Smaller doses are given if albuminuria is present. The cure is completed by iron and arsenic. T. P. B.

AUSTRALIA.

Dengue Fever.—In Brisbane, Ipswich, Townsville, and in several other towns of Queensland, a widespread epidemic of dengue fever prevailed during March 1905. The epidemic was so severe that business was seriously interfered with, in Brisbane as many as one-third of the population being prostrated by the disease at one period. Although dengue fever has occurred in Queensland before, during no previous outbreak has it prevailed to so great an extent in the more southerly parts—that is, the cooler parts of the State.

Plague.—Cases of plague were reported from Brisbane and Newcastle during March and April of this year.

Plague and Rats.—The connection between plague and rats has been insisted upon by Dr. J. Ashburton Thompson, President of the Board of Health of New South Wales; and the outbreaks of plague have been largely fought by the destruction of rats. Success seems to have resulted from the measures adopted. As evidence of the persistency of plague, despite the fact that the disease seemed to have disappeared from amongst both men and rats for a considerable period—the city of Sydney for eight and a half months (July 14th, 1902, to April 30th, 1903) was free from plague in men, and apparently in rats—although some 17,000 rats were examined in the laboratory during that period. On May 12th, 1903, however, a plague-infected rat was found, and between that date and August 15th, 1903, 111 rats and fifty mice were found to be plague infected. During the recurrence of plague amongst rats two cases of the disease were found in human beings. Dr. Thompson is of opinion that rats may be more widely attacked than the evidence afforded by rat-catching would indicate, as an animal suffering from the disease is likely to die in its hole or run rather than be caught in a trap.

Notes and News.

The Club System in South Africa.—The medical men in Pretoria wish to prevent the introduction of contract practice and the club system of medical relief into that city. An attempt, it is understood, is being made by a section of the community to obtain the services of a medical man for the work from this country. It is well to let it be known that any intending applicant for the post will be running contrary to the wishes of his medical brethren in Pretoria. Hitherto appeals of the kind have seldom had a deterrent effect upon a certain class of the medical profession; on this occasion, however, let us hope the appeal may not be in vain.

The annual dinner of the Epidemiological Society will be held at the Grand Hotel, Trafalgar Square, on Friday, June 30th, at 7.15 p.m., Dr. B. A. Whitelegge, C.B., F.R.C.P., H.M. Chief Inspector of Factories and the President of the Society, in the chair. Applications for tickets to be made to the Honorary Secretaries, Drs. H. Timbrell Bulstrode and W. H. Hamer.

Plague in India.—Sir Walter Foster, in the House of Commons on Friday, May 12th, asked the Secretary of State for India for the return of deaths from plague in India during the past two months. Mr. Brodrick replied that the returns for the month of March had not yet been received, but that during the four weeks ending April 1st the deaths from the disease numbered 60,046.

The Comparascope.—At the conversazione held in the rooms of the Royal Society on May 17th, Mr. D. Finlayson showed the Comparascope, an accessory to microscopic investigation, by which direct comparisons can be drawn between microscopic objects. The mechanism is designed to bring into focus the objects in two separate slides side by side in the field of vision, so that an exact comparison between the two sets of objects can be simultaneously obtained. The instrument should be of value in determining differences between bacteria and other microscopic objects that closely resemble each other.

Travelling Ophthalmic Hospital in Egypt.—The relief of ophthalmia in Egypt, which was provided for by a gift of £40,000, made by Sir Ernest Cassel, in 1902, has been attempted with great success. Mr. F. A. MacCallan has had charge of the measures, consisting of a travelling ophthalmic hospital. Lord Cromer, in his report for 1904, states that "the experiment has proved a complete success." Over 3,000 patients were treated at the hospital and and 1,268 operations, chiefly for trachoma, were performed.

The Effects upon Development of Different Temperatures.—An interesting account of experiments made by Professor Standfus, of Zurich, upon variations of type caused by exposing ordinary caterpillars in the different stages of metamorphoses to temperatures varying from 40° C. to 4° C. (99° to 25° F.) is at present occupying attention. Most of the caterpillars developed into butterflies of different type to their immediate primogenitures, some "throwing back" to adults of ancient species, whilst still more interesting is the announcement that others developed into totally new species so far unknown to scientists. If the record is true, it would seem that we are at the threshold of an important and quite new method and type of scientific investigation, not only as regards butterflies and affiliated creatures, but, it may be, for the whole of the animal kingdom. The effect of exposure to variation in temperature on living things may possibly also extend to other circumstances of environment, such as dryness, moisture, the presence in the air of certain gases, or in the soil and food of particular salts during development. The field for observation and experiment is practically illimitable, and it would be well were some insect, such, for instance, as the mosquito, dealt with on the lines initiated by Professor Standfus. These observations serve to suggest proof by laboratory experiment of the evolution of species.

New Drugs.

EUDRENINE.—Parke, Davis and Company, 111, Queen Victoria Street, London, E.C., have supplied a mixture under the trade-mark name of "Eudrenine," to serve as a local anæsthetic and hæmostatic for the painless and bloodless extraction of teeth, and for use in general surgery. Eudrenine contains $\frac{1}{6}$ gr. (0·01 gm.) of beta-eucaine hydrochloride, and $\frac{1}{2000}$ gr. (0·033 mgm.) of adrenalin chloride (takamine) in each cc. (16·9 minims). For tooth extraction it can be used undiluted by injecting into the gum, ten minutes before operating, the contents of one or two ampoules (8 to 17 minims), according to the number of teeth to be extracted. For small surgical operations Eudrenine may be used undiluted, but where a large area requires to be anæsthetised it may be diluted with four volumes of physiological sodium chloride solution. The combination of eucaine and adrenalin has revolutionised minor surgical operations, allowing the surgeon to operate single-handed, a most important factor in country practice, and still more so in tropical countries, where even the assistance of a medical neighbour it is frequently impossible to obtain. Eudrenine for the medical practitioner will be found to be at once handy for use and satisfactory in its effects.

The British Pharmacal Company, 12, Furnival Street, Holborn Bars, London, have brought out in conule (Setteries) form a compound termed "Ephedrin" for rectal use in hæmorrhoids, anal fissure and pruritus ani. "Ephedrin" consists of the active principle of suprarenal gland combined with æsculin, the native principle of horse-chestnut bark.

So far as our observations have gone, the Ephedrin conules in cases of, so-called, tropical ulcer of the rectum are most efficacious in speedily allaying the severe pain which follows defæcation in these cases.

Messrs. Martindale, 10, New Cavendish Street, London, W., supply the subjoined drugs.

IODIC ACID is a deodorant and preservative, even when diluted to the extent of a 1 in 2,500 solution. It is employed in ozæna, for deodorising offensive urine, as an irrigant in empyema (strength 1 in 500) and for leg ulcers, as a mouth-wash, *e.g.*, in inoperable epithelioma, and as a throat swabbing in diphtheria. It was found very useful in a case of extensive burning (1 in 500 solution). Internally a drachm of a 1 in 100 solution well diluted has been given in gastro-intestinal sepsis; it has further proved of value administered internally in typhoid fever. The calcium salt has been principally employed up to the present.

CALCIUM IODATE (zinc iodate is similarly used) is useful as a dusting powder. An ointment containing 10 to 20 grains to the ounce of hydrocarbon base is valuable. A lotion is employed in septic and suppurating wounds, and a gauze (3 per cent. strength) may be used for the same purpose. Healing ensues with the production of a dry scab.

A warm saturated solution is used as a vaginal douche or bladder irrigant, This iodate is eminently efficient as a mouth-wash or gargle. There is a field of usefulness for it in dentistry, *e.g.*, in pyorrhœa alveolaris, &c.

An ointment, 10 grains to the ounce, has been found to be a veritable specific in various forms of eczema. A solution is further useful as an irrigant in otorrhœa. Hypodermic injections of from $\frac{1}{2}$ to 2 drachms of an emulsion of 3 drachms of the iodate in an ounce of glycerin have been used in tuberculous joints.

MERCURIC IODATE contains 46 per cent. of available iodine. As a general antiseptic it is probably more efficient than either mercuric perchloride or biniodide.

In a pronounced sycosis of hairy parts of the face an ointment containing 20 grains to the ounce produced an effectual cure.

BISMUTH SUBIODATE has been used in lupus in powder form and ointment, 20 grains to the ounce, and in scrofulous glands as a dusting powder.

(See *Lancet*, January 21st, 1905.)

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"British Medical Journal," May 13, 1905.

1. The Logical Basis of the Sanitary Policy of Mosquito Reduction. An Address delivered at the Section of Preventive Medicine of the International Congress of Arts and Sciences, Universal Exposition, St. Louis, September, 1904. By Ronald Ross, C.B., F.R.S.

2. The Plague in India. Medical Notes in Parliament.

(1) Ross deals in detail with the new sanitary policy which aims at the reduction of disease-bearing insects, especially those which are the disseminating agents of malaria, yellow fever and filariasis.

His conclusions are:—

(*a*) The mosquito density will always be reduced, not only within the area of operations, but to a distance equal to the ideal limit of migration beyond it.

(*b*) On the boundary of operations the mosquito density should always be reduced to about one-half the normal density.

(*c*) The curve of density will rise rapidly outside the boundary, and will fall rapidly inside it.

(*d*) As immigration into an area of operations must always be at the expense of the mosquito population immediately outside it, the average density of the whole area affected by the operations must be the same as if no immigration at all had taken place.

(*e*) As a general rule for practical purposes, if the area of operations be of any considerable size, immigration will not very materially affect the result.

In conclusion, it must be repeated that the whole

subject of mosquito reduction cannot be scientifically examined without mathematical analysis. The subject is really a part of the mathematical theory of migration—a theory which, so far as I know, has not yet been discussed. It is not possible to make satisfactory experiments on the influx, efflux, and varying density of mosquitoes without such an analysis, and one, I may add, far more minute than has been attempted here. The subject has suffered much at the hands of those who have attempted experiments without adequate preliminary consideration, and whose opinions or results have seriously impeded the obviously useful and practical sanitary policy referred to. The statement, so frequently made, that local anti-propagation measures must always be useless owing to immigration from outside is equivalent to saying that the population of the United States would remain the same even if the birth-rate were to be reduced to zero. In a recent experiment at Mian Mir in India the astounding result was obtained that the mosquito density was, if anything, increased by the anti-propagation measures, which is equivalent to saying that the population of the United States would be increased by the abolition of the birth-rate. In the meantime I, for one, must continue to believe the somewhat self-evident theory that anti-propagation measures must always reduce the mosquito density, even if the results at Havana, Ismailia, Klang, Port Swettenham, and other places are not accepted as irrefragable experimental proof of it.

(2) On Monday Mr. Herbert Roberts asked the Secretary of State for India what was the estimated cost of the scientific investigation into plague in India, and what proportion of this expenditure would be borne by the British Treasury; whether he would state what success had attended the work on Dr. Haffkine's system; whether the scientific expedition would have its headquarters at the Pasteur Institute at Kassauli; and whether the present investigation would proceed on the line of bacteriological research. Mr. Brodrick replied that the expenditure was estimated at £5,000 for the current year. No portion would be borne by the British Treasury. Inoculation was a valuable preventive but it was not popular, and its effects were not regarded as permanent. The question as to the headquarters of the expedition would be settled locally between the Government of India and the head of the expedition, while the line of investigation would be determined by the scientific societies controlling the work. He had no doubt that bacteriological research would be largely resorted to. In answer to a further question respecting the congested states of the towns affected, Mr. Brodrick said that in Bombay and Calcutta, where the congestion was most serious, the Government was actively promoting the provision of additional building accommodation for the poorer classes. Elsewhere such overcrowding as existed was due to the habits and predilections of the people rather than to absence of building land or dearness of materials. In plague-stricken localities assistance to move was often offered to the inhabitants but was not seldom refused.

"British Medical Journal," May 20, 1905.

1. Treatment of Sea-Sickness. By J. Metcalfe Sharpe.

2. The Identification of Mosquitoes. By W. Scott Patton, M.B., Lieut. I.M.S.

3. The Aims of Tropical Medicine, Leader.

(1) Sharpe considers sea-sickness to be due to a nervous vomiting; the reflex action is transmitted by the vagi to the solar plexus. Taking this as the basis for evolving a mode of treatment on scientific lines. Sharpe finds that by paralysing the accommodation of one eye the symptoms of sea-sickness were greatly ameliorated. He applies two or three drops of a solution of atropine (4 grs. to the ounce) or other mydriatic to the conjunctiva of one eye daily after a satisfactory examination with the ophthalmoscope, &c. When the passenger objects to having the pupil thus dilated, Sharpe merely bandaged one eye. By thus altering the principal focus, the motion of objects on board ship, which Sharpe considers to be the active impulse in producing sea-sickness, is not uniformly transmitted to the brain. Administration of soporifics and general depressants are condemned; but if chloral hydrate has to be used, it is best given in 20 to 30-grain doses *per rectum*.

(2) Patton states that the Anopheles which is the carrier of malaria in the Aden district is *Anopheles arabiensis*, a species new to literature. There are no Anopheles of the genus *Cellia* in the Aden district. The *Anopheles wellcomei*, as announced by Mr. Theobald, is not identical with the *Anopheles arabiensis* (Patton). Lieut. Patton, writing from Jubbulpore, India, claims to have found five new Anopheles, and a description of these is promised at an early date.

"Journal American Association," February 25, 1905.

Plague and late Cholera Epidemic in the Philippine Islands.

Dr. Paul C. Freer, Superintendent of Laboratories of the Philippine Islands, states that the Philippine Islands were visited by two cholera epidemics before American occupation, one in 1882 and the other in 1888, and in these years the mortality was very high. During both of these epidemics Manila had no water supply except from wells, and it was after the second epidemic of 1888 that one of the former Governor-Generals gave a donation to start the Manila water supply works, which was completed afterwards. The third cholera epidemic occurred during the American occupation and about three years after Americans landed on the islands. Dr. Freer referred to the organisations in the Philippine Islands and the scant means at hand for limiting the epidemic. In order to secure complete co-operation the Philippine Commission established the Board of Health. The city of Manila was divided into seven districts, each in charge of a medical officer taken from the contract medical service. These officers, together with a corps of medical inspectors, began a system of house-to-house inspection. At this time the most serious disease was bubonic plague. Although the number had diminished markedly since American occupation, a recrudescence of the epidemic was feared. Many of the facilities acquired for controlling the plague epidemic were put to good use subsequently in dealing with cholera. Large barracks were constructed which would hold 2,500 people. When plague occurred in a house the patients were

taken from it to the hospital, thus leaving the premises free for disinfection, &c. About December, 1901, three months after the plan was first discussed, there were constructed six barracks which accommodated a thousand people comfortably, and during the cholera epidemic they took in as many as 2,400 at one time. Whenever plague was suspected in a certain house a member of the laboratory staff was called in for diagnosis, and if the case proved to be plague the patient was taken to the hospital, or, if dead, to the morgue, and a radical alteration of the house undertaken; either its destruction by fire, if beyond repair, or complete rebuilding. It became necessary to destroy and rebuild whole districts in the city, and in this way plague was eradicated completely from the districts where it was prevalent. The main weapon against plague was the destruction of rats. In the first month the Board of Health destroyed about 2,000 rats, after which the number ran up to 20,000 a month. Fifty thousand rats were caught in the first three months. A large number of rats were examined at the laboratory for the plague bacillus. Two hundred and seventy-two rats were found to be infected with plague and had come from various houses. One-half of these houses were disinfected, burned down, if necessary, or altered. They managed to diminish the number of cases of plague by these measures, so that in March, 1902, there was not a case of plague in the city, nor had there been one for three weeks.

Cholera patients were isolated in a contagious disease hospital. The houses in which cholera was most prevalent were burned first and the property appraised afterwards. Two thousand people were taken out of the infected district and transported in waggons, ambulances, &c. The number of cases soon diminished, until finally the disease was entirely controlled and eventually wiped out.

A serum laboratory has been established which produces all of the antitoxins and sera necessary for work in the Tropics, including rinderpest serum. The Board of Health has procured new ambulances, has enlarged its disinfecting corps, and has perfected district organisation.

"The Journal of the American Medical Association," April 1, 1905.

1. Lecithin—Its Possible *Rôle* in Radiotherapy. Leader.

2. Acute Meningitis. By W. T. Councilman, M.D.

(1) Kyes has pointed out that Lecithin may act as a complement in hæmolysis produced by cobra venom, thus playing a *rôle* analogous to that of a ferment.

(2) Councilman in an able paper states that the *Diplococcus intracellularis meningitidis*, as first demonstrated by Jäger in 1865, is the specific cause of acute epidemic cerebro-spinal meningitis. The organism was first described, however, by Weichselbaum in 1887 as a specific micrococcus resembling the gonococcus.

Councilman remarks that "the organism is one which is cultivated with difficulty. Morphologically, the organisms appear as diplococci occurring as paired hemispheres, separated by well-marked, unstained intervals, and showing in cultures considerable variation in size. There is a tendency to grouping in fours, or tetrads. In cover-glass preparations from the meningeal exudate, the diplococcus is frequently situated inside leucocytes and sometimes within the nucleus. The appearance is very much like that of gonorrhœal pus. The organism is decolourised by the Gram method of staining; in cultures it grows best on blood serum. The colonies are round, colourless, slightly convex or flat, moist and viscid-looking; they may become confluent. The organism has feeble vitality and dies out quickly under cultivation. It has a weak pathogenesis for laboratory animals. The cultures vary in virulence in certain cases; 1 cc. of a bouillon suspension of a twenty-four-hour blood serum collected and injected intraperitoneally in a guinea-pig will kill the animal in forty-eight hours."

The disease seems to prevail in Massachusetts, U.S.A., with peculiar pertinacity. Danielsen and Mann described the disease in that State as long ago as 1806, and there have occurred four epidemics since then, namely, in 1809, 1864, 1874 and 1897. Between the epidemics sporadic cases occur; the months of April, May and June being the time of the year when deaths from this cause are mostly recorded. The number of cases during recent years were as follows: 1897, cases 355; 1898, cases 259; 1899, cases 240: 1900, cases 165; in 1901, cases 176; and in 1902, cases 165.

Examination of the nasal secretion has in several recorded cases of cerebro-spinal meningitis exhibited the presence of the *Diplococcus intracellularis*, indicating perhaps a primary infection of the nose; on the other hand, it may be that the nasal infection was due to extension from the meninges.

The disease is not always fatal, as many suppose; many cases of recovery are recorded even when the presence of the infection by the specific organism has been proved by lumbar puncture. Sporadic meningitis is caused by other organisms, especially by the pneumococcus or the staphylococcus, both of which are much more fatal in their results, although there is less tendency in these infections to involvement of the tissue of the brain and cord, nor is the extension along the nerves so marked.

"Lepra," vol. v., fax. 2, 1905.

LEPROSY IN THE FRENCH COLONIES.

Historique sommaire de la lèpre dans les colonies française. By A. Kermorgaut, Paris.

Kermorgaut states: Leprosy exists in most French Possessions. I have collected all the information known on the subject, and will describe the measures taken by us to guard against this plague, which grows more formidable day by day.

COLONIES IN AMERICA.

These are: French Guiana, Martinique, Guadeloupe, and the St. Pierre et Miquelon Islands.

Guiana.—Leprosy is supposed to have been introduced at the end of the seventeenth century by the importation of negro slaves. It is mentioned in official documents dated 1777. In 1859 Dr. Laure writes that the disease was spreading with such rapidity that one-tenth of the population was infected. The number of lepers in Guiana were estimated in 1889 to be about 300, of which 150 were in Cayenne and its neighbour-

hood; only forty-nine were isolated. The natives do not take any precautions, mixing freely with those affected.

There are two leprosy establishments—Acarouany and Saint Louis. The latest official decree was issued in 1891, ordering the isolation of all persons affected, but it is not put in force.

The treatment used is chaulmoogra oil, by injection and by the mouth.

Martinique and Guadeloupe.—First observed at the time of the immigration of negro slaves. A law was passed in 1718 to prevent the sale of infected slaves. There is a hospital at La Désirade for lepers. The number admitted in 1899 was 121. Isolation is not compulsory. Very few children are born in the establishment: from 1859 to 1899, ten. Every precaution is taken to prevent their infection, and they are separated from their mothers and sent to their relations when six months old. Dr. Noël finds chaulmoogra oil or pills of gynocardic acid and sulphate of strychnine, with frictions of europhen, 5 per cent. in chaulmoogra oil (most efficacious in the general pains in commencing leprosy), the only useful drugs.

Colonies in West Africa.

Leprosy has been observed in all our colonies from the earliest date of their establishment. Originating in Arabia and Egypt, it has gradually spread all over the continent.

Senegal.—In 1882 Borius records that leprosy is very common, and Bérenger-Féraud observed leprosy and ainhum.

The natives recognise two forms — macular and tubercular, and know that it is contagious. The tribes under the influence of fetichism make their lepers live apart. On the contrary, the followers of Islam, with its broad precepts of charity and brotherhood, do not look upon a leper as impure or contagious, and mix freely with them. This is of serious import, owing to the steady increase of the Mussulman religion amongst the inhabitants. With the suppression of the slave trade the other cause of the spread of this disease tends to disappear. The Administration has not so far taken any official steps to prevent its increase.

French Soudan.—Leprosy is observed to be gradually increasing.

Guinea.—Leprosy is fairly frequent (Dr. Evon), and is not considered contagious by the natives, who live in common with the infected.

Ivory Coast.—Leprosy exists in many parts of this colony, where the lepers are isolated by their families. Those affected avoid white people as much as possible. There is constant intercourse with the natives of the adjacent English colony, the Gold Coast, where there are two leper hospitals and many dispensaries established for gratuitous medical treatment.

Dahomey.—Several cases have been observed by Dr. Sanzeau.

French Congo.—Leprosy has been reported by several observers, and ainhum is also common. Leprosy exists in the Congo Free State.

Colonies in East Africa.

Madagascar.—Leprosy has undoubtedly been known for a long period, as there were at one time stringent laws for the isolation and detection of persons suffering from leprosy. Later on these laws fell into abeyance. General Gallieni, alarmed at the increase of the disease, established several leper hospitals: (1) Ambohidratrimo, with 700 patients, in 1902; the infants born are at once separated from their mothers. (2) Mankavaly, with 295 patients, in 1903. Average number in 1902 was 205. (3) Miarinarivo, with 165 inmates. (4) Antsirabe, 651, in 1902, under the Norwegian Mission. (5) Ambositra, just built in a province with 800 to 1,000 lepers. (6) Fianarantsoa, with four hospitals: the Government hospital, with 199 inmates, in 1902; the London Missionary Society's, with 35; the Norwegians', with 20; and the Jesuit Fathers', with 50-60. The statistics return the number of 600 lepers in this province, of which 260 were isolated in 1902. The Jesuits have commenced to build a new hospital to contain 200 patients. (7) Farafangana, built by the Lazarists Fathers in 1902, with more than 300 lepers. Other hospitals are being built. No attempt is made either by the Missions or the Government to isolate the infected properly. In 1902 the isolated lepers had risen to 2,540. In these provinces there are a little more than three lepers per 1,000 inhabitants.

Comoro Archipelago.—It is presumed that leprosy has existed here for a long time, owing to the constant intercourse with Arabia, Persia and India. The inhabitants recognise its contagiousness, and isolate the victims of this disease. There is a leper hospital at M'Zambourou containing sixty-four patients. *Moheli.*—Leprosy exists in this island in all its forms, and is extending, as there is no isolation of the sufferers, who travel about wherever they choose. There is a place chosen for isolation, but they do not remain there. *Anjouan.*—The inhabitants drive away all lepers, who live by themselves at Chicoundouni and at La Selle. *Great Comoro.*—In this island, with a population of 53,000, there are only twenty lepers.

Colonies in the Indian Ocean.

Reunion.—A leper hospital was founded in 1852 at Saint Denis by an order decreeing strict isolation of all cases. This order is not now enforced. In 1902 the leper establishment at La Montagne sheltered sixty-one persons. The treatment consists in good food, tonics, bicarbonate of soda, baths, and chaulmoogra oil by the mouth or pills of gynocardate of magnesia. Icthyol also has given good results, and soda salicylate is given in the febrile paroxysms. Hypodermics of cacodylate of soda rapidly improve the general condition, abolish anæmia, increase weight, and cause ulcerations and tubercles to cicatrise and disappear. The sores are cleansed with potash permanganate and dressed with aristol or orthoform ointments. An ointment of icthyol 50, lard 70, olive oil 30, is much used, and a lotion of gurgun balsam and lime water for ulcers.

India.

Pondichery.—There is one hospital dating from 1849 with 44 inmates in 1903. The lepers are not strictly isolated, and the pilgrims to the Chapel of St. Lazare insist on associating with them. The disease is on the increase, and the returns give 300 lepers, or 1·72 per 1,000 approximately, and at Chandernagore, in 1899, 1 in 3,700. In 1898 there were 584 lepers in our

establishments. As the natives conceal their infected relations, there are probably about 778 diseased.

INDO-CHINA.

Cochin China.—Formerly the natives isolated those affected with leprosy, but at present, although they consider the disease to be contagious and hereditary, they allow them to live amongst them. They amount to 4,000 or 5,000 and mix freely with the people. In 1903 a leper hospital was constructed on the island Culaorong with 600 beds,

Cambodia.—Leprosy is common in all the provinces, and is increasing. Although the natives recognise its contagiousness and that it is hereditary, the lepers live with their families until they are unable to work. They are then made to live apart or become beggars and live around the monasteries.

Laos.—This is the only disease that the natives fear, and they rigorously isolate the infected. It does not seem to increase on this account, and will disappear completely.

"Gazetta Medica di Roma."

MALARIAL INFECTION.

Guido Bacelli, from observations made in Italy, arranges malarial infections according to their periodicity into: (*a*) Quotidian, the chill appearing before noon; (*b*) tertian, appearing about noon; (*c*) quartan, appearing after noon. Pernicious malaria, according to Baccelli, presents itself as one or other of two chief groups: (*A*) A pernicious group due to conditions present in the individual. Under this heading seven main types are indicated: (1) Dysenteric; (2) bilious; (3) cardialgic; (4) diaphoretic; (5) syncopal; (6) algide; (7) comatose. In addition there is the hæmoglobinuric and hæmaturic types of less frequent occurrence but highly fatal. (*B*) A severe type of fever, which Baccelli terms subcontinuous, but in which the paroxysms appear so close together that the course of the fever is almost continuous, the symptoms following a catarrhal, rheumatic, bilious or typhoid type, or a mixture of all these types. The symptoms are due to toxins manufactured by the parasites during the process of sporulation.

Plague.

PREVALENCE OF THE DISEASE.

India.—During the weeks ending April 22nd, 29th, and May 6th, the deaths from plague in India amounted to 54,602, 56,732 and 52,253 respectively. The Punjab and the United Provinces are the most severely afflicted districts; in the former the figures were 27,372, 28,728 and 30,909, and in the United Provinces 16,737, 15,710 and 12,909 respectively.

South Africa.—During the weeks ending April 22nd, 29th, and May 6th, the plague report was as follows: *King William's Town*, fresh cases 2, 3 and 2; deaths 1, 0 and 2. *East London*, fresh cases 6, 2, and 1; deaths 5, 3 and 0. *Port Elizabeth*, 1 fresh case during the last week. *Port Beaufort*, 2 fresh cases and 1 death during the last week.

Hong Kong.—During the weeks ending May 13th and 20th, fresh cases 17 and 20; deaths 12 and 18 respectively.

Queensland.—No cases of plague from April 9th to April 20th. No cases in hospital on April 20th.

DEATHS FROM PLAGUE IN INDIA DURING RECENT YEARS.

Year.	Deaths from Plague.
1901	273,679.
1902	577,427.
1903	851,263.
1904	1,022,299.

From January 1st to May 6th, 1905, no less than 739,353 persons died of plague, indicating a mortality return for 1905, unless an unexpected decline takes place, of nearly 2,000,000 deaths from plague.

EXCHANGES.

Annali di Medicina Navale. Annali d' Igiene Sperimentale Archiv für Schiffs u. Tropen Hygiene. Archives de Medicine Navale. Archives Russes de Pathologie, de Médec. Clinique et de Bacteriologie. Australasian Medical Gazette. Boletin de Medicina Naval. Boston Medical and Surgical Journal. Bristol Medico-Chirurgical Journal. British and Colonial Druggist. British Journal of Dermatology. British Medical Journal. Brooklyn Medical Journal. Caducée. Climate, Clinical Journal. Clinical Review. Giornale Medico del R. Esercito. Hong Kong Telegraph. Il Policlinico. Indian Medical Gazette. Indian Medical Record. Indian Public Health. Interstate Medical Journal. Jahresbericht. Janus. Journal of the Royal Army Medical Corps. Journal of Balneology and Climatology. Journal of Laryngology and Otology. Journal of the American Medical Association. La Grèce Médicale. Lancet. Liverpool Medico-Chirurgical Journal. Medical Brief. Medical Missionary Journal. Medical Record. Medical Review. Merck's Archives. New York Medical Journal. New York Post-Graduate. Pacific Medical Journal. Polyclinic. Public Health. Revista de Medicina Tropical. Revista Medica de S. Paulo. Sei-i-Kwai Medical Journal. The Hospital. The Northumberland and Durham Medical Journal. Transactions of the American Microscopical Society. Treatment. West India Committee Circular. West Africa.

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Original Communications.

PLAGUE IN THE BRITISH EAST AFRICAN PROTECTORATE.

(Forwarded for publication by the courtesy of the Under-Secretary of State for the Colonies.)

REPORT No. I.

By J. A. HARAN, M.A., M.B., B.Ch.(Dublin).

Kisumu, February 14, 1905.

EVER since my arrival here, I have introduced and rigidly enforced the system within the municipal area whereby no body could be buried without previous medical inspection. The report of the death of an elderly Swahili, on the evening of December 28th, 1904, drew attention to the quarter inhabited by the Swahili hut-tax collectors and their followers. It would appear that this man came from Baringo, *via* Londiani, on the previous Sunday, had sickened within twenty-four hours of arrival, and died on the above date. No buboes were demonstrable and permission was given for burial, the householder being warned to bring future cases of illness occuring within his compound to the hospital for treatment.

On the evening of December 30th, 1904, two more deaths were reported from the same house, both being Wasoga who had resided two months in Port Florence. A bubo having been demonstrated on one of the bodies, enquiry was at once instituted, and the presence of four dead rats in the house caused orders to be issued for its destruction by fire and the segregation of all the other inhabitants. This was immediately done, the people being placed under guard.

On December 31st, 1904, a thorough inspection of the Indian Bazaar, some 300 yards distant from the infected quarter, was made, and the inhabitants ordered to thoroughly cleanse their houses. This was complied with, although, thanks to constant effort, the bazaar was in a very fair condition indeed. Search for rats proved futile.

On January 1st, 1905, all the hut-tax quarter was burnt (sixteen huts), with the exception of three dwellings remote from the seat of the outbreak which were reserved for the accommodation of the segregated. Daily inspection of these people took place, and on the 7th they were removed to fresh quarters and the huts (three) burnt, together with ten others. Constant and rigorous inspection of the Indian Bazaar was meantime maintained and the segregated from the hut-tax quarter made the object of particular attention.

On January 9th, 1905, the first case (Allahbai) appeared in the Indian Bazaar. He was at once sent to hospital and the other occupants of the house placed in a camp separate from that occupied by those previously segregated. The disease then appeared in a house opposite, and subsequently broke out in the lower part of the street on the side on which it first appeared. The procedure adopted was the same in all cases, viz., isolation of the sick, segregation of all the contacts, and closing of the infected house as a preliminary to disinfection.

CLEANSING AND DISINFECTION.

Systematic cleansing and disinfection were begun early. Each house in turn was emptied of its contents, the floors moistened with disinfectants and then swept up and the refuse burnt. Air and light were admitted freely by the removal of sheets of iron, and the sides and floors of the main building and outhouses limewashed. The goods remained exposed to the sun all day and all unclean articles burnt. The bazaar was so treated throughout. At the commencement of the undertaking living rats were alone met with, but as the cleaners progressed down the street dead rodents were happened on, particularly in the infected houses. These latter possessed uncemented floors and were, for the most part, overcrowded with merchandise, the plots being obviously too small for their purpose. Had larger areas been assigned, shops and dwellings could have been separate and arrangements for storage been made.

The disinfection of the bazaar having been completed, a lull ensued. On January 26th, however, a fresh case appeared in a house situated at the end of the infected row, which was rented by Mr. Hakin. This house was well ventilated and lit and had been entirely limewashed. An isolated case then appeared on the *Winifred*, the victim being the only Pathan and the dirtiest man on board. These were followed rapidly by four other cases from the bazaar, the last living in the side street to the north-east. Evacuation of the bazaar ensued and the deserted houses are now surrounded by a guard, the inhabitants having gone under canvas to a clean spot on the most elevated part of the hill.

THE TYPE OF THE DISEASE.

The type of the disease has been in most cases bubonic, two cases alone being of the septicæmic type. Invasion was marked by a rise of temperature, severe headache, staggering, thickened speech, rapid pulse, hurried breathing, epistaxis. Tender or enlarged glands either simultaneously appeared or very quickly followed. Rapidly ensuing delirium occurred, the tongue becoming dry and brown with the advent of typhoid symptoms. Hæmorrhages were frequent, with involuntary evacuation of bladder and rectum. Death usually took place within twenty-four hours of the onset. I have already forwarded a list of patients.

HOW TO DEAL WITH AN OUTBREAK.

With regard to the future, I would humbly advise that compensation be granted and a new bazaar be erected by Government, the houses of which shall be let out at an annual rent. The place, according to Wakavirondo, has been already visited by plague at a time prior to the arrival of the European, on which account the hill had been deserted. It would be therefore wiser to retain absolute control of all dwellings erected in such an area. Houses should be well lit and ventilated and built on stone or iron piles, dwelling house, store, kitchen and shop being all separate.

The return to the bazaar of its occupants after twelve days' freedom from plague is most inadvisable, as the disease will not have ceased among the rats until some months have elapsed. Indeed, these

animals control the situation at present. Satisfactory disinfection and cleansing of houses will necessarily involve excavation of the supporting earthen plinth (which is merely faced with stone set in mud), to the threatened collapse of the house. This will involve great expenditure of time and money, and may not be satisfactory, as reports note annual recurrence of plague in the same houses despite elaborate measures.

Kisumu is merely part of the epidemic plague area which borders the lake. Koch identified the bacillus in 1898, since when outbreaks have been noted in Buddu, Bukoba, Muanza, Shirati and (last May's case) Kisumu. This unhappy termination of the Uganda Railway renders all precautions at railhead most necessary, for while outbreaks at isolated stations may be regarded without fear, the presence of many centres of a more or less insanitary character along the line makes an outbreak of plague the cause of the greatest apprehension. With a Government-owned bazaar, let out to tenants at an annual rent, all insanitary conduct can be visited without delay, if necessary, by the expulsion of the offender. Another advantage will be that the new bazaar site will be more remote from the railway terminus and will not embarrass traffic should trouble occur in the future.

The Part Played by Rats.

The movements of the rats during the present outbreak are of interest. At the period of the first case enquiry revealed that the animals had practically disappeared, abandoning houses and stores and leaving but a few behind. With the increase of cases dead rats were happened on, especially among bags of grain and coils of wire and rope. They are now noted as showing a slight tendency to return, though dead rats have been found in bazaar houses even after thorough cleansing. They are evidently dying in the plinths and come forth at the last moment. The limit of a plague area may possibly be coterminous with the boundary within which the particular infected tribe or host of rats is limited, such having no communication with neighbouring tribes.

I may mention that the railway authorities have thoroughly cleaned and ventilated all native quarters, to the advantage of the building concerned.

It may not be without interest to note that the late Sub-Commissioner at Usoga, Mr. W. Grant, C.M.G., informed us that four of Lubwa's wives died of plague one afternoon within half an hour. He states the disease has been well known for years in Usoga and Kavirondo.

Plague Report No. II.

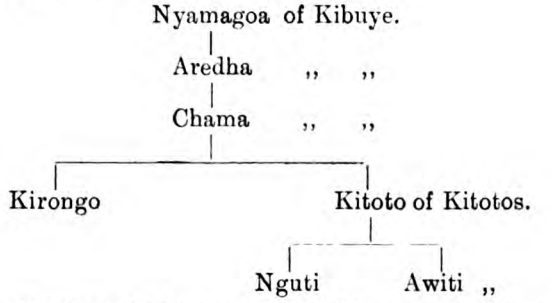
Kisumu an Endemic Area.

By D. Milne, M.B., C.M.(Aberd.).

February 14, 1905.

Enquiries as to the previous existence of plague at Kisumu revealed the fact of a common knowledge amongst the natives of a fatal malady that had attacked the dwellers on the present Government site long before the advent of the white man.

An intelligent Kavirondo, named Ngutu, half brother to the local chief, gave the following information regarding it, prefacing his replies by stating that he had learnt all he knew of it from his father and mother and the talk of the old folk in the village. As his genealogy is mixed up in his account, for the sake of clearness it is given below. These forefathers had been in occupation of Kibuye Hill, the local name of the ridge on which Kisumu is built.



In the time of Nyamagoa and his son Aredha, an epidemic broke out in the village on Kibuye Hill, characterised by pain and swelling in the groins and fever, the swelling sometimes very large. The disease was very fatal, many men, women, and children dying rapidly from it, including the chief and his son. This disease they called "Tuo." Chama, grandson of Nyamagoa, being sick of the disease, deserted the hill for the plains, going towards Kibos with his people. There he died, and his son, Kitoto, moved some ten miles further away and founded the present village bearing his name. Kitoto was apparently aged about fifteen years old at the time, and died two years ago an old man; from a passing recollection of him, putting his age at sixty-five to seventy years, would date the finish of the epidemic at about fifty years ago. Since that time there has been no other outbreak till the present one.

Hearing that Nguti's uncle, Kirongo, one of the village elders, was still alive, he was produced and interrogated.

His account, collated for coherent narration, was as follows:—

The Kisumu Kavirondo were of the Ja-lŭŏ tribe, and came from the Acholi country (bordering the Nile between Nimule and Wadelai). His forefathers had settled on the Usĕmi hills (fourteen miles across the bay on the shores of the lake from Port Florence as the crow flies). There they were attacked by this disease, tuo, as a result of which they left the hills and came down and settled on the plains, where the disease, again breaking out amongst them, drove them to shift so that they came on the Kibuye ridge. Three months after they had built their huts it broke out once more with renewed violence. They stood its ravages for two years, when once more they evacuated to Kitotos, where they had resided in safety ever since. At the time of this last hegira, he was an infant at his mother's breast; all he related he had heard spoken by his father and mother.

Both narrators stated that the disease was confined to the lake shores; they had never heard of it on the Nandi hills. As to the origin of its coming, the native idea was that it was the work of Shaitan, and came from eating cattle which had died through being infected by eating the bad grass on the hill, or

it came from dead fish. Often on the surface of the lake fishermen found dead fish floating; these brought home, cooked and eaten, produced the disease. There was no cure for it; all they could do was to move from one spot to another.

Several other Kavirondos in the town — police sergeant and headmen—were interrogated, and all gave substantially the same account as above.

We may, therefore, accept as authentic the existence of a previous outbreak in the Kisumu district of a rapidly fatal spreading epidemic, lasting over several years, attended with fever and bubonic symptoms; in other words, of bubonic plague. Taking this fact in consideration with the information already collected regarding other parts of the lake shores, we may conclude that the railway terminus and port *is* situated in an endemic home of plague.

(1) Dr. Christy, in an article, "Kaampuli" (Bubonic Plague) in Equatorial East Africa, published in the *British Medical Journal* in the end of 1903, states that he found a definite history of Kaampuli (Luganda for "Plague") in various districts from Entebbe to German East Africa round the west side of the Nyanza.

(2) Koch's report on Plague in German East Africa, an abstract of which is published in Dr. Christy's paper.

(3) In the last two years definite cases of plague have been reported by competent observers at Muanza and hinterland, Bukoba and Sherati, and German East Africa.

NOTE.—The translation of the Kavirondos' stories was conducted by H.M. Sub-Commissioner, Kisumu.

PLAGUE IN SIAM.

By H. CAMPBELL HIGHET, M.D., D.P.H.

Chief Medical Officer Sanitary Department, Siam.

For the first time, so far as is known, the capital of Siam has been visited by a slight outbreak of bubonic plague.

On December 20th, 1904, information was brought to the Health Department of Bangkok that several suspicious deaths had taken place on the west bank of the river. The Medical Officer of Health at once proceeded to investigate the matter, when it was found that four deaths had occurred, that the symptoms had been very high fever, with sudden onset and death within thirty-six hours at the latest. No buboes or other swellings had been noticed, but in a house adjacent to that in which three persons had died an old man was discovered who on examination proved to be suffering from typical bubonic plague.

All these cases were limited to a settlement of British Indians, but, on further enquiry, the Health Officer learned that another death from high fever, with buboes, had occurred in the house of a Siamese nobleman just outside the Indian settlement. There was also a history of great mortality amongst the rats for a week or two previous to the outbreak, followed apparently by migration of any surviving rats to other localities.

A cordon of police was at once drawn round the infected area, one lot of dirty wooden houses was pulled down and burned, others were vacated, the people being housed in temporary mat sheds within the cordon; a gang of rat-catchers was set to work, and thorough cleansing and disinfection of the district was carried out. Some days were spent in burning the rubbish, filth, and general odds and ends which one always finds in such settlements of the East. Wherever a death occurred, the houses were practically gutted out, the contents burned, and compensation was at once given for the loss incurred. The corpses were at once cremated and the houses disinfected.

A reward was offered to all persons bringing rats dead or alive to a police station, with the result that within a period of two months over one hundred and fifty thousand rats have been destroyed.

A temporary isolation hospital was established to which the sick were removed. Eleven deaths in all took place within the cordon. Previous to the quarantine being imposed a woman who had attended one of the fatal cases had fled in terror to the east bank of the river. There she sickened and died—the case only coming to the notice of the authorities after her death. All persons who had been in contact with this woman were removed to the isolation hospital and the house disinfected.

Ten days after the last case the cordon was removed, but the following day another very sudden death from plague took place in the infected district. A young Siamese male, aged twenty-one years, developed fever at six p.m., suffered from severe diarrhœa throughout the night, and died at seven in the morning—a bubo meanwhile having arisen in his left groin. This was the last case that has been discovered within the Indian settlement. The cordon was not renewed and no further case of plague was detected until a period of twenty-one days had elapsed, when, on January 22nd, it broke out in a fresh district adjacent to the Indian settlement. From this date till February 11th seventeen fresh cases were discovered. All arose in districts close to the Indian settlement and were preceded by mortality amongst rats.

A few remarks may be made with regard to the outbreak.

SOURCE OF ORIGIN.

It was impossible to trace how the infection entered Bangkok. Nothing definite could be discovered to throw any light on the question.

NATURE OF THE CASES.

The first cases were extremely acute, partaking of the nature of an acute septicæmia, death occurring within twenty-four to thirty-six hours without there being time for buboes to be noticed. Later cases proved more typical of the ordinary so-called bubonic plague. We had one very rapid case, already referred to, in which severe diarrhœa was the principal feature. Buboes were noted in the inguinal, femoral, iliac, submaxillary, occipital and axillary regions. Had we not known that the first cases were plague, the cases with swollen submaxillary glands might have escaped detection, as there was at the same time in Bangkok a widespread epidemic of true mumps.

Towards the end of the outbreak only were recoveries obtained. One pneumonic case was noted.

DEATH-RATE.

Of a total of twenty-nine cases, twenty-three died, giving a death-rate of 79 per cent., which agrees with epidemics in other places in the East.

Bacteriological Examination.

All cases were not verified by bacteriological examination, but from time to time smears were made from glands excised *post mortem*, and in all plague bacilli were discovered in abundance.

Administrative Difficulties.

So far as the Siamese Government was concerned everything went perfectly smoothly. His Majesty the King, recognising that prompt measures were necessary, gave full power to the Medical Officer of Health, placed the whole police force at his disposal, and gave *carte blanche* with regard to expense.

The usual scare arose, however. Wild rumours arose all over the town that the Health Department was kidnapping women and children, taking them to the plague hospital, there putting ice on their chests until death supervened, when the bodies were opened, and the gall-bladders removed for the purpose of preparing fresh poison wherewith to kill fresh victims. The life of the M.O.H. and his assistants were so persistently threatened that police guards had to be provided. A royal proclamation explaining the nature of the disease and the steps that were being taken to stamp it out was published with excellent result. This, with the prosecution of a woman who was discovered spreading false reports, allayed all excitement in a couple of weeks.

AN ENQUIRY INTO THE ETIOLOGY AND PATHOLOGY OF BERI-BERI.

By Hamilton Wright, M.D.(McGill).

Director of the Department for Medical Research, Federated Malay States.

Abstract No. II.

Described as Observation No. I.

(From vol. ii., No. 1, "Studies from Institute for Medical Research, Federated Malay States." Printed by authority of the Resident-General, F.M.S. Singapore: Kelly and Walsh, May, 1902.)

The New Gaol in Kwala Lumpor presents quite unique possibilities for an enquiry into the etiology of beri-beri, for the disease has been endemic and frequently epidemic since eight months after the Gaol was opened in January, 1895. The daily average of prisoners is between four and five hundred, the yearly record of beri-beri is rarely less than one hundred.

Up to May 3rd, 1901, many of the prisoners were employed at extra-mural road-making and other work, and it was impossible to say whether they contracted beri-beri as the result of some extra-mural agent or an agent intrinsic to the Gaol itself.

I determined to have all the prisoners confined to the gaol, to place the different nationalities on as uniform a diet as was consistent with their habits and under as nearly as possible uniform conditions in regard to work, personal hygiene and daily routine.

I proposed to determine—

(1) If the disease was contracted intra-murally, or extra-murally by prisoners engaged on work beyond the gaol walls.

(2) The value of certain diets as etiological factors.

(3) Whether or not a racial immunity existed.

Dr. E. A. O. Travers, State Surgeon of Selangor, before my arrival in the Peninsula, had made very important observations concerning the prevalence of beri-beri in the Old and New Gaols of Kwala Lumpor. These I quote at length.

The Old Gaol.

Dr. Travers reports: Up to January, 1895, all prisoners in the State of Selangor were kept in the Old Kwala Lumpor Gaol. This was situated on a small hill about 180 feet above the sea level and was surrounded by open grassy land. The buildings consisted of two large blocks of separate cells, made partly of wood and partly of brick, the outside walls being of brick. The floors of all cells, with the exception of those on the ground level, were of wood.

The New Gaol.

This is situated about 1½ miles from Kwala Lumpor on an open grassy hill about 160 feet above sea-level. The grassy hill slopes rapidly away to low-lying swampy land used by Chinese as vegetable gardens.

The piece of ground enclosed by the gaol wall was for many years used as a burial ground for Chinese, and over half its extent was studded with graves, some of them being very old and others of comparatively recent date. Altogether some 400 coffins and remains, in varying stages of decay, were taken out of the ground when the gaol wall was built.

The Chinese buried on the gaol site had been for the most part employed in the very extensive tin mines in the neighbourhood. It is not probable that many of them died from beri-beri. I can discover no history of any epidemic in the neighbourhood, and am told by those who know that there were very few cases of beri-beri in the mines when the cemetery was in use.

Prison Diets.

From a study of the Prison food it is evident that the diets were well balanced and generous except in the case of short sentence prisoners. As it is not usual for the latter grade of prisoners to oftener contract beri-beri than long sentence prisoners, it does not appear that punishment diet can be regarded as a factor in producing the disease.

Medical History of Prisoners in Old and New Gaols.

Up to the year 1894 all prisoners were kept in the Old Kwala Lumpor Gaol.

On January 1st, 1895, all prisoners were removed to the New Gaol and the Old Gaol was temporarily abandoned, with the exception of the Infirmary, to which all patients were sent until March 20th following.

So long as they were confined to the Old Gaol the health of the prisoners left nothing to be desired.

No cases of beri-beri originated in the Old Gaol, and those prisoners who were admitted to it suffering from the disease rapidly recovered. No death from beri-beri occurred while prisoners were living in the Old Gaol.

During the years 1893 and 1894 an average of 117 prisoners was employed at the New Gaol site. They were occupied chiefly at masonry work, stonebreaking, and later in levelling. They slept in temporary wooden association wards on the site of the present building. The prisoners employed on this work were as healthy as those working at the Old Gaol.

At the time of the removal of the prisoners to the New Gaol on January 1st, 1895, the New Gaol buildings were not completed, and the majority of the

prisoners were, therefore, employed in assisting the masons.

Dysentery and Cholera.

During the first quarter of the year 1895 the general health of the prisoners was not good, a large number of cases of dysentery and diarrhœa occurred, and the case mortality rose to 6·9 per cent. The case mortality for the second quarter was 7 per cent.

On August 10th cholera broke out, and during the following ten days 126 cases occurred, causing 68 deaths. This outbreak was distinctly traceable to the water supply. No cases occurred after the introduction of an entirely fresh supply of water from a hill reservoir about eight miles away. I regard it as more than a coincidence that an outbreak of acute beri-beri followed shortly on this outbreak of cholera. I have given evidence that fatal acute cases of beri-beri present a lesion of the stomach and small gut that points conclusively to the contents of those parts of the area in which occurs the multiplication of the specific organism and the elaboration of its toxin. It is altogether likely that the water supply to which was traced the cholera outbreak was also in part the original source of the beri-beri infection. All the facts that I have been able to observe tend to confirm a view that the specific organism of beri-beri is of low resisting power and that it is quickly destroyed in the presence of sunlight and oxygen. It would, therefore, not remain as a contamination of water for a long period. In this connection it should be recalled that the severe outbreak of beri-beri that occurred in Manila, 1882-83, followed hotly on the track of a severe outbreak of cholera (*see* Königer, "Beri-beri in Manila," *Deutsch. Arch. f. Klin. Med.*, xxxiv., 1884). That the outbreak of beri-beri did not cease when the new water supply was turned on to the New Gaol is to be accounted for by the fact that the cells of the prisoners had in the meantime become infected.

During the first half of the year 1895 seventeen prisoners were admitted to the New Gaol suffering from acute beri-beri, but no cases originated in the Prison itself.

Outbreak of Beri-beri in New Gaol.

The first case of beri-beri reported as having been actually contracted in the New Gaol occurred on August 3rd, 1895. Another was reported on the 7th and two others on the 26th and 28th of the month. In September 32 cases occurred. All these cases were treated at the New Gaol Infirmary and proved of a most fatal type, causing thirteen deaths during the month.

The case mortality from beri-beri during the month of September, 1895, was 31·7 per cent., as against 9·09 per cent at the District Hospital, Kwala Lumpor, where 354 cases of this disease were treated, with 32 deaths. It should be noted that the mortality at the Gaol was the mortality of an acute outbreak, while the mortality at the District Hospital was largely the mortality of residual beri-beri paralysis.

Effect of Transformation to Old Gaol.

Arrangements were then made to transfer all convicts suffering from beri-beri to the infirmary at the Old Gaol. The beneficial results of this were at once apparent.

On October 21st, 1895, sixty apparently healthy prisoners were sent back to the Old Gaol, and a gang of from 90 to 125 were kept there till July, 1896.

The prisoners sent to the Old Gaol were not specially selected, except that no convict showing symptoms of beri-beri at the time was transferred. These prisoners kept in good health, and no fresh cases of beri-beri occurred among them during the time that they were at the Old Gaol. The average number of prisoners at the New Gaol during the same period was 289; 345 cases of beri-beri were admitted to the Infirmary from amongst them.

The Part Played by Water Supply.

Advantage was taken of the opportunity presented for the residence of a large number of prisoners at the Old Gaol to test the possible influence of water supply on the outbreak of beri-beri. The pipe water supply was cut off the New Gaol and turned on to the Old Gaol, on April 1st, 1896, the prisoners at the New Gaol being supplied with water from wells. This arrangement was continued until July 7th, 1896, during which time no cases of beri-beri originated in the Old Gaol, but 117 cases were admitted into the infirmary at the New Gaol.

Food.

The prisoners suffering from beri-beri, who were transferred from the New Gaol Infirmary for treatment at the Old Gaol on October 1st, 1895, and the healthy prisoners who were transfered on October 25th, 1895, to the same building, were fed on exactly similar rations as those remaining in the New Gaol. The food was cooked and prepared in the New Gaol together with that for the other prisoners, and was carried twice daily to Old Gaol in a hand cart. This arrangement was continued until December 14th, when raw rations (with the exception of rice, which was sent direct to the Old Gaol by the contractor) were sent daily from the New to the Old Gaol, and were cooked in the latter building.

The rapid improvement in the condition of the sick prisoners after their transfer to the Old Gaol, and the excellent health enjoyed by the prisoners transferred from the New Gaol for a period of nine months during which the convicts remaining at the New Gaol were severely attacked with beri-beri, is remarkable as showing that, in at any rate this epidemic, food and water supply had no bearing whatever on the causation or progress of the disease.

To positively eliminate all the dubious points I determined to confine all the prisoners to the main part of the Gaol, except a small party, and put them under as uniform conditions as possible with regard to diet, personal hygiene, work and sleep.

Influence of Season.

It appears to be true that the great majority of cases of beri-beri occur in the Malay Peninsula during the north-east monsoon, *i.e.*, during the months from September to April. It is certainly true of beri-beri in the Kwala Lumpor Gaol. The original outbreak began in August, 1895, and in the following years the

vast majority of cases originated between August and May. Original cases of beri-beri do certainly crop up in the Gaol between April and September, but the larger number of cases seen during the south-west monsoon are really cases of more or less severe beri-beric residual paralysis. For this reason it was advisable that my observation should begin with one monsoon and end with the other. I chose the beginning of the south-west monsoon blowing between April and September. It permitted the prisoners to be on a high grade diet for a first six months during which, under ordinary circumstances, few cases of beri-beri originate. Further, it prepared them efficiently, if a normal diet could do so, to withstand the onset of any other factor, meteorological or otherwise, which seems to exist in association with the contrary monsoon.

Distribution of Prisoners.

On May 3rd, 1901, I made a physical examination of all prisoners in the Kwala Lumpor Gaol, and took their history both previous to and after incarceration, to ascertain those who at the time had or had had beri-beri within five years, whether contracted within or without the Gaol. Of the whole number of prisoners 101 had had beri-beri, 18 of them still bearing signs of beri-beric residual paralysis. The 101 prisoners, to be known as Party No. 1, were placed in a separate part of the building and at separate work.

Party No. 2 was composed of 113 prisoners who did not then have, or never had had beri-beri; the party slept and worked by themselves.

A third party, to be known as Party No. 3, was composed of 33 prisoners who at the time did not have and never had had beri-beri. It was placed in separate cells to sleep. It should be stated here that no case of beri-beri is known to have originated in this block. The work of Party No. 3 was wholly extra-mural; grass cutting and water carrying at the gaolers' and warders' quarters just outside the main gateway. This party averaged about 36 during the eleven months of observation. Its strength was maintained by allotting to it prisoners from Party No. 2 who on incarceration were found to be free of signs and history of having had beri-beri. The whole party was specially watched to prevent any member of it supplementing his gaol diet. It was not possible for any prisoner in this party to get food surreptitiously.

A fourth party, to be known as Party No. 4, was composed of about 38 cooks, dhobies and tailors who had had more or less severe beri-beri in the Gaol but who had almost wholly recovered. I was, in view of their having had beri-beri, warranted in regarding them as immune. During the day they were employed in the kitchens and laundries. At night they slept apart. The party scarcely changed during the eleven months' observation, all of its members being long sentence prisoners.

Dietetic and Hygienic Conditions under which the Prisoners were placed.

After segregating the prisoners into four parties my object was to render the conditions as to clothing, sleep, water supply, personal hygiene, &c., as uniform as possible to all parties.

The prejudices of the various races in the matter of diet had to be recognised, of course.

The water supplied to all prisoners for drinking and bathing was direct from the Kwala Lumpor water supply, which is above suspicion.

The rice was a good quality of Siam or Rangoon. It was supplied to the Gaol in bags twice a week. I frequently inspected it and always found it sweet, dry and free of mould. Bacteriological examinations of rice direct from the bags was made several time during the observation. Spores of *B. subtilis* and *Asperg. niger* were common, as in Observation No. 4 I found they were common to all rices. I was never able to detect more than the spores of the above organisms. But by moistening the rice with warm sterilised water the spores of both mould and bacterium were induced to grow. The rice as supplied to the Gaol was, however, always free of mould. *The rice before being delivered to the prisoners for their mid-day and evening meals was steamed for two and a half hours under two atmospheres of pressure, while that for the morning meal was boiled from* 8 *p.m. to* 5 *a.m. to form a congee or porridge*, a treatment sufficient to exterminate all known organisms and destroy all known toxins. Several bacteriological examinations of the rice made after it had been steamed under pressure and boiled proved it be free of mould spores and the spores of *B. subtilis*. The rice as delivered to the prisoners in the Kwala Lumpor Gaol was free of all organisms or toxins and generally above criticism.

The beef, pork, mutton and eggs supplied to the Gaol were regularly inspected, and if not up to a high standard were replaced by better.

Vegetables were chiefly cucumber, yams, lettuce, potatoes, French beans, pumpkin and peas grown by Chinese gardeners. Such vegetables are in the growing stage top-dressed with human excreta.

Much of the excreta used is collected in the neighbourhood of mines and other foci of beri-beri, and it seemed possible to me shortly after arrival in the Peninsula that it might be the chief medium of infection, assuming beri-beri to be due to a germ which gained entrance to the body *via* the alimentary tract. This assumption was suggested by the condition of the stomach and duodenum in the first twenty *post mortems* on acute pernicious cases. But in June, 1900, I made an experimental observation, outlined in Observation No. 5, to determine if the germ or its toxin was present in top-dressed vegetables. It does not seem so as the result of that observation.

Top-dressed vegetables may, I think, be excluded as the carrier of the cause of beri-beri in the gaol. It would seem that assuming they did hold a toxic substance it would be removed by the washing or destroyed by the two hours' boiling they underwent before delivery to the prisoners. In connection with this point it should be noted that beri-beri is almost unknown amongst Chinese market gardeners. They generally live alone or with their families in detached shacks.

The proportion of nitrogen to carbon in the above diet averaged about 1 in 12. This is a higher proportion of nitrogen than is generally recognised as normal. To those who believe beri-beri to be due to nitrogen

starvation I will point out later that on this diet 49 original cases of beri-beri occurred in Party No. 2, and 102 had paralytic relapses in Party No. 1. Most of the cases occurred after the prisoners had been on the diet for four months.

The bad feature of the Prison routine is that after lock up at 5.30 p.m. the prisoners must defecate in pans of earth in their cells; that the excreta is not removed till next morning, and that the first meal is eaten before the hands are washed. It is obvious that this system is hygienically bad. Beyond doubt it is an active agent in the vitiation of the Gaol atmosphere, and, as I will point out later, seems to be the probable source of the Gaol infection and of the transmission of the organism of the disease from man to man. Prisoners suffering from acute beri-beri and beri-beric residual paralysis are admitted to the Gaol in large numbers; the average length of occupation of any cell is short. It is more than probable that the acute cases infect the floors and blankets by means of their excreta, and that such infection is carried into the food of others by unclean hands.

Influence of Rainfall.

It is doubtful if mere increase in the rainfall has any direct effect in the causation of beri-beri. But it is probable that in a so badly constructed place as the Gaol it affords the moisture necessary for the virile development of the specific organism.

Incubation Period.

This analysis appears to indicate that the incubation period of beri-beri may be as short as ten days. It is in keeping with information gathered over the wider field of the whole Peninsula (*see* paras. 76 to 84). Most of the cases that occurred within thirty days of incarceration developed the disease suddenly and the sensory and motor paralysis rapidly spread from the lower to the upper thoracic and lower cervical segments of the spinal cord. It is possible, of course, that several of the thirteen cases that occurred within fourteen days were infected before incarceration. Against this, however, is the fact that eight of them were Kwala Lumpor rickshaw and shop coolies, a class in which beri-beri is rarely seen.

Nationality.

Beri-beri as seen in the Goal is no respecter of nationality; the Chinese furnish the vast majority of cases both relatively and otherwise.

Results Obtained by the Eleven Months' Observation.

(1) Beri-beri is independent of diet considered as diet; (2) the Gaol itself is a focus in which the virus of beri-beri is generated; (3) beri-beri is, broadly speaking, an infectious disease.

Proof that Diet per se is not a Causative Factor of Beri-beri.

The diet of all prisoners was as physiologically correct as that provided in the Japanese Navy after 1884, and to which is ascribed the disappearance of beri-beri from its *personnel* by several Japanese authorities, Takaki more particularly. In spite of this physiologically correct diet, 49 cases originated and 123 redeveloped signs of paresis or recontracted the disease during its continuance at the Gaol, and after the regular scales of diet were reverted to there was no increase but rather a decline in the number of cases of beri-beri.

This is conclusive proof that on a diet qualitatively and quantitatively correct beri-beri is, nevertheless, contracted. It positively eliminates diet regarded as diet as a factor in the causation of the disease.

Proof that the Causative Factor of Beri-beri is Intra-mural.

It will, I think, be granted that the members of Parties Nos. 1 and 2 were isolated from extra-mural pathogenic factors, except what—

(*a*) Might be wafted in on the air;

(*b*) Be introduced in the dietetic articles;

(*c*) Be brought to bear on them by a slight mediate contact with members of Party No. 3 who worked at extra-mural work but bathed at tank No. 5, though at a different time to Party No. 2;

(*d*) By infection introduced in the clothes or systems of prisoners admitted to the Gaol during the eleven months of observation.

All these and other extra-mural factors were, I think, effectively eliminated by the precautions I took to segregate Parties Nos. 1 and 2, and the dietetic and general hygienic arrangements I placed them under.

In regard to (*a*), if beri-beri in the Gaol is due to a volatile poison or to micro-organisms suspended in the atmosphere and wafted amongst the prisoners, all the prisoners would be equally exposed and it would be only reasonable to expect that members of Party No. 3 would have contracted beri-beri in a proportion equal to the members of Parties Nos. 1 and 2. As already stated, no member of Party No. 3 contracted beri-beri. So that factor (*a*) is eliminated.

In regard to (*b*), I have intimated in paragraphs 284-292 that it was not possible for an infective or other causal agent of beri-beri to reach the prisoners in parties Nos. 1 or 2 *via* the dietetic articles. The rice as delivered to the prisoners was sterile. Infected fish, supposed by some authorities to be the direct or indirect cause of beri-beri, was absolutely excluded from the diet of all prisoners. Infection that might have been brought about by the use of top-dressed vegetables is also eliminated, for experimental evidence (Obs. 5) and enquiry amongst Chinese gardeners is wholly against such a view. Further, the vegetables delivered to the prisoners were so prepared as to destroy all known organisms and toxins. Any assumption that the diet of the prisoners looked at qualitatively or quantitatively was a factor in the production of beri-beri in the Gaol is again contradicted by the entire escape of members of Party No. 3, who were on the same diet as Parties Nos. 1 and 2.

To the reasonable mind it must be obvious that neither the diet itself was a causal factor of beri-beri or was a vehicle through which the causal factor of beri-beri was introduced from without into the Gaol. This view, however, does not exclude the possibility that the prisoners who contracted beri-beri may have done so by infecting their food after it was delivered to

them. They eat with their fingers, and I will later on point out that it is not improbable that it is by this means that the organism of beri-beri gains an entrance to the system.

In regard to (*c*), it is not probable that members of Party No. 3 could have introduced the causal agent of beri-beri and infected 90 prisoners by bathing at the same tank with them (though at a different time) without one or two of the party itself contracting the disease. On the contrary, it must be admitted that by placing Party No. 3 in the Administration Block and using it, as I did, as the extra-mural party, I placed an effective screen between Parties Nos. 1 and 2 and deleterious outside influences.

I confess that it is impossible to eliminate the extra-mural factor (*d*). I know of no method by which it can be positively determined to day that a prisoner admitted to a gaol or other focus of humanity does or does not carry the cause of beri-beri upon or within his person. To grant that he does is to grant that beri beri is an infectious or contagious disease. All the facts that I have been able to accumulate point to the disease being infectious, but not contagious. I must admit that in this one particular the members of Party No. 1 and Party No. 2 to a lesser degree were not successfully segregated from extra-mural influences. This appears more plainly in the analysis of the 90 cases in relation to time of incarceration (*vide* para. 346). It will be observed that 13 cases in Party No. 2 developed beri-beri within fourteen days of admission to the Gaol. I have admitted above that it is probable that several of the 13 may have contracted the disease a short time previous to incarceration; the three who went down with the disease within seven days, at any rate. There is no doubt in my own mind that this was a large factor in the original mode of infection and still is a large factor in the continued prevalence of the disease in the Gaol.

Taking all facts of the observation into consideration, it must be admitted that the members of Parties Nos. 1 and 2 were successfully isolated, except in regard to the factor (*d*). To recognise this factor is to confess that beri-beri is an infectious disease. It is probable that certain of the 90 cases were admitted with infection in them, but it is positive that the great majority contracted beri-beri as the result of an infection that already existed in the Gaol.

Nature of the Infection.

Loss of appetite and oppression in the epigastrium is the first symptom complained of by those who contract the disease. I find it to be most pronounced in fatal acute pernicious cases, and the warrant for it is the angry inflammation and hæmorrhagic injection of the mucosa of the stomach and duodenum found *post mortem*. I have never found the *Ankylostoma duodenale* in any of these cases. Its ova was especially sought for, but was not found. There can be no question of the inflammation in these cases being due to it.

The theory of the causation of beri-beri that fits the above facts and all others observed in British Malaya is that beri-beri is due to a specific organism which gains entrance to the body *via* the mouth, that it develops and produces a toxin chiefly in the pyloric end of the stomach and duodenum, and that the toxin, being absorbed, acts atrophically on the peripheral terminations of the afferent and efferent neurones. Further, that the specific organism escapes in the fæces and lodges in confined places through accident or the careless personal habits of those affected by the disorder, and that in the presence of congenial meteorological, climatic and artificial conditions of close association from overcrowding, the organism becomes virulent and, gaining entrance to the healthy body in food, &c., contaminated by it, gives rise to an attack of the disease. The fact that the germ remains so closely focal can, I think, be explained by its being at once destroyed by the action of direct sunlight or that the presence of CO_2 or some other gas is necessary for its virile development. It seems from my observations here that the active stage of the organism in the body is between three and four weeks. I base this estimation on the facts that the preliminary feeling of oppression in the epigastrium ceases at the end of about three weeks, and that it is rare to find the lesion of the gastric and intestinal mucosa in cases of only six weeks' standing.

"Le Caducée," April 15, 1905.

Tropical Ulcers.

H. Vincent has described a small coccus found in an ulcer contracted in Guadeloupe that does not grow in ordinary media and not staining by Gram. Usually the ulcers are due to the bacilli found in hospital gangrene associated with a spirillum. In healthy subjects the bacilli produce little effect. The author has failed to inoculate himself. In subjects debilitated by residence in the Tropics, the slightest contamination of wounds produces extensive ulcers.

The treatment recommended is scraping to remove all dead tissue, then irrigating with perchloride of mercury or carbolic acid, followed by dry dressing with chloride of lime, in the strength of 1 in 10 boric acid for severe cases, and 1 in 15 for mild cases.

T. P. B.

"Archives Med. Milit.," No. 9, 1904.

Latent Leprosy.

Pelges describes the case of a man who left the Navy in 1882 after four years' service, most of the time being spent in the East, where he met individuals in the condition he is now in.

He remained in perfect health and worked as a fisherman until 1899, when as the result of exposure he was laid up for several weeks, having whitlows while convalescent. But a diagnosis of leprosy was not made until he was admitted to hospital in August, 1903, twenty-one years since he had seen a case of leprosy. T. P. B.

"Lancet-Clinic," Cincinnati, April 29, 1905.

Piroplasmosis Hominis. By P. M. Ashburn.

The paper by Ashburn gives an account of one case of "Spotted Fever" reported in the Bitter Root Valley and in the vicinity of Missonla Montana during the year 1904.

Business Notices.

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THE

Journal of Tropical Medicine

JUNE 15, 1905.

THE MONETARY VALUE OF LIFE.

AT the Indian Medical Service Dinner on June 8th Lieut.-Colonel Freyer made allusion to the subject of medical men in India not being allowed to accept large fees in return for successful medical treatment of natives of India. This has been a vexed question for some time, and it crops up rather acutely now and again. The rule in British governmental circles is that not only no fee but no present even may be accepted for the public work done, or proposed to be done, by Government officials. Did no such understanding exist, it is easy to conceive that in many ways corruption might creep into public life in connection with various works and undertakings. The extension of this rule, however, to those who are the means of lessening bodily suffering and the cure of disease is stretching the tether to an extent which smacks of prudery. The imposition of an order regulating the amount a man may pay his doctor seems to be either a stage of advanced socialism or of autocratic interference with the subject, which may or may not be for the public good. In India the former cannot be said to obtain, and the latter would seem to be dictated from a high standpoint of benevolent paternity.

The question of medical and especially fees for surgical operations on which life and death actually depends, is a curious anomaly. A surgeon who receives 100 guineas for an operation by which he saves a rich man's life is supposed to be highly paid. Within a few weeks afterwards the same man may spend that sum and more in one evening's entertainment of his friends—a thank-offering for his recovery—to which in all probability the man who saved his life is not invited. The fact is, human life is cheap even amongst the wealthy and high-placed, and judging by the payment of the man who is the instrument in prolonging that life, 100 guineas is about the maximum in this country at which the patient or the patient's friends and relations value his or anyone else's life. In India some of the rulers set a higher value upon their lives, and consider one hundred times 100 guineas not too much to be restored to health. It is a mere question of reward for value given, and a man is the best judge of the value life is to him.

The sum allowed to be received by medical officers in the Indian medical service on the one hand, and the sum offered them by native princes or rich men for having cured them of disease on the other, has caused the resignation in recent years of at least one well-known medical officer. That this should be so may be consonant with discipline, but no such regulation was in existence when that officer joined the Service, otherwise in all probability he, along with many other capable men, would never have been induced to join it. Breach of contract does not hold good in the Services, and men are bound to submit to any rules and regulations which may be imposed; but a breach of contract is neither just nor equitable, however sheltered by autocratic *régime*, and in the long run the injustice tells in the case of every Service, for either good men leave it or refuse to accept office in its ranks.

BRITISH MEDICAL ASSOCIATION.

Seventy-third Annual Meeting, Leicester, July 24th, 25th, 26th, 27th and 28th, 1905.

Section M.—TROPICAL DISEASES.

President: RUBERT WILLIAM BOYCE, M.B., F.R.S., London.

Vice-Presidents: ANDREW DUNCAN, M.D., London; FLEMING MANT SANDWITH, M.D., London.

DEAR SIR,—It is hoped that the Section on Tropical Diseases at the forthcoming meeting of the British Medical Association will be well attended, and that all those interested in this branch of medicine will endeavour to be present and will unite to make the meeting successful, both by taking part in the discussions and by contributing papers.

The following subjects have been selected for discussion:—

Wednesday, July 26th.—"Tick Fever."

Thursday, July 27th.—"Sprue and Hill Diarrhœa."

Friday, July 28th.—"Tropical Diseases of the Skin."

The Section will meet at 10 o'clock each day.

The following gentlemen have already promised to take part in the discussions or to contribute papers: Dr. H. E. Annett, Prof. Rubert Boyce, Dr. Anton Breini, Mr. James Cantlie, S. R. Christophers, M.B., I.M.S., Dr. Andrew Duncan, Dr. J. E. Dutton, Sir Patrick Manson, Dr. W. T. Prout, Prof. Ronald Ross, Dr. L. W. Sambon, Dr. F. M. Sandwith, Dr. J. W. W. Stephens, Dr. Wolferstan Thomas, Dr. T. L. Todd.

We shall be obliged if you will let us know at your earliest convenience if you will be able to take part in any of the above discussions, or if you propose to contribute a paper on some subject.

Papers bearing on the discussion or otherwise will be read for gentlemen unable to be in England for the meeting.

The Secretaries will be glad to receive pathological specimens, drawings, photographs, and microscopical preparations for exhibition at the meeting.

We are, Dear Sir,

Your obedient servants,

G. A. CLARKSON, F.R.C.S., *Hon. Sec.*, 11, Southgates, Leicester.

J. H. M. MACLEOD, M.D., *Hon. Sec.*, 11, Harley Street, London.

Regulations for the Conduct of Sections.

(1) Papers at the Sectional Meetings must not occupy more than fifteen minutes in the reading, and no subsequent speech must exceed ten minutes.

(2) Authors are requested to send short abstracts of their papers not later than May 15th.

(3) The text of papers submitted for publication in the *British Medical Journal* as part of the report of the Section should represent what is actually read in the Section.

(4) Each author should hand the text of his paper in proper form for publication to one of the Secretaries of the Section immediately after it is read, or at the latest at the end of the day's meeting of the Section. Neglect to comply with this request may result in the omission of the paper in question from the proceedings of the Section published in the *British Medical Journal.*

(5) Papers read are the property of the British Medical Association, and cannot be published elsewhere than in the *British Medical Journal* without special permission.

(6) Authors of papers not read have no claim for the publication of their papers in the *British Medical Journal. Papers cannot be taken as read.* If not read they form no part of the proceedings of the Section.

THE SWATOW MOSQUITO LAMP.

THE value of the Swatow mosquito lamp as a method of destroying mosquitoes is known to Europeans in South China and the Straits Settlements, and has been used by the Chinese for a long period. I am tempted to mention the value of this lamp, in the first place, because I am fully convinced of its efficacy when properly used, and because I have seen a communication addressed to Messrs. Montague, 101, New Bond Street, London, from a high medical authority in India. The communication runs thus:—"With reference to Cantlie's mosquito lamp you sent me, I beg to point out that the lamp in question seems to be a fraud. I lighted it with spirit in several rooms and it did not attract a single mosquito." I am much obliged to Messrs. Montague and to the medical officer in India for having drawn my attention to this failure, as it enables me to state the use to which this

lamp may be really put. The lamp will not *attract* mosquitoes, it will only destroy them when the lamp is *brought to them.* It is chiefly useful *inside* the mosquito net. Supposing one has, on retiring, tucked the mosquito net in all round the mattress, and then discovers that one or more mosquitoes remain inside the net, it is easy to raise the net sufficiently to reach the lamp, if it is conveniently placed by the side of the bed, to light the lamp and to kill the mosquito by placing the large mouth of the lamp over the mosquito, which when thus attacked attempts to escape by the upper opening or chimney. In its passage, however, it is necessarily exposed to the flame of the lamp and burnt. The light of the lamp when thrown on the mosquito seems to paralyse the insect, for, as a rule,

it remains quite stationary until the mouth of the lamp is made to touch the net (or other surface) on which the mosquito may have happened to alight.

The "oil" for the lamp must *not* be spirit nor petroleum, or any other readily inflammable substance, otherwise there is danger of setting fire to the bed. Native oil used for lamps is the best:—rape oil, nut oil, or any vegetable oil used for burning in lamps by natives of warm climates is what is required. I lay no claim that this lamp should be called "Cantlie's," as it is merely the lamp known as the "Swatow," extensively used in South China as a mosquito destroyer, and being convinced of its efficacy, I induced Mr. Montague to make and supply it. It is only necessary to take the lamp on one's travels, as oil of the kind required can be had from the natives of any district.

JAMES CANTLIE.

Abstracts.

ON A PARASITE FOUND IN PERSONS SUFFERING FROM ENLARGEMENT OF THE SPLEEN IN INDIA (THIRD REPORT).

By LIEUT. S. R. CHRISTOPHERS, M.B., I.M.S.

Scientific Memoirs by Officers of the Medical and Sanitary Departments of the Government of India. New Series, No. 15, 1905.

ABSTRACT.

THE DEVELOPMENT UNDERGONE BY THE PARASITE IN CITRATED BLOOD AT A LOW TEMPERATURE.

THE correct zoological position of the parasites described in my previous reports is extremely uncertain. They have been variously classed as Piroplasmata—the view held by Laveran and Mesnil and by Major Donovan, I.M.S.; as Trypanosomata—the view of Major Leishman, R.A.M.C., and of Marchand and Ledingham; as protozoa of an unknown nature—the view first put forward by Major Ross, I.M.S., and later taken up by others; and as the spores of a microsporidian.

Captain Rogers, I.M.S., recently announced that, by adding blood, obtained by splenic puncture from cases of splenomegaly caused by the parasites, to a small quantity of sterile citrate of sodium solution and keeping it at a temperature of 22°C. for two or three days he had succeeded in observing the development of the parasites into trypanosomes.[1]

Observers who had put forward the opinion that the bodies are a stage in the development of a trypanosome looked upon Captain Rogers' discovery as a confirmation of this view of their nature, but it was apparent from an examination of the illustrations attached to his article that the bodies which Captain Rogers regarded as fully-developed trypanosomes differed considerably from ordinary trypanosomes found in animals. They possessed no undulating membrane, the micro-nucleus or centrosome was situated at the end of the parasite from which the flagellum emerged, and the flagellum appeared to pass out of the parasite directly from the micro-nucleus. In a later communication[2] Captain Rogers recognised these differences, and stated definitely that in no instance was an undulating membrane present, nor did the flagellum pass forwards towards the macro-nucleus.

In the main I have been able to confirm Captain Rogers' results. Indeed, most of the forms figured by him, including very elongate forms, have occurred in my preparations. In addition I have been able to observe certain further appearances not described by him, which appear to take place at a later date, and to add some details of description. On the other hand, I have been unable to accept his conclusions regarding conjugation of the large oval forms, or to be convinced that the nature of the bodies is yet finally settled.

Technique.—A 10 per cent. solution of citrate of sodium in distilled water is freshly prepared.

Some time before the operation of spleen puncture is to be carried out, a Burroughs and Wellcome "all-glass" syringe (small size) fitted with a platino-iridium needle is rinsed out with the citrate solution and placed in a test tube with the piston resting upon a pad of wool. About ·5 c.c. of citrate solution is left in the syringe, and the cotton pad is damped with the same. The test-tube is plugged, and the whole sterilised at 120° C. for half an hour in the autoclave.

At the bedside the test-tube is tilted to allow the syringe to fall needle downwards against the plug. The plug is then removed far enough to allow the barrel of the syringe to be seized by the fingers. It is convenient to have three or four prepared syringes at hand, in order to reduce the amount of preparation necessary at the bedside.

Immediately before puncture any excess of fluid is ejected from the syringe, only a little being allowed to remain in the needle and nozzle. A successful puncture should one-third or one-half fill the barrel of the syringe.

Blood from the syringe is ejected with the fullest precautions as to sterility into small sterile tubes. I have found "arsenic tubes" (straight 3″ × $\frac{3}{8}$″) very suitable, their narrowness and length being antagonistic to desiccation and contamination during the frequent examination of the blood. For sterilisation these tubes may be heated to 120° C. in the autoclave, or merely passed through the flame till "browning" of the cotton plug takes place. *No citrate solution is added to the tubes.* After blood has been ejected into the tubes, I have found it convenient to enclose them in a small tin canister containing a little damp wool and provided with a tightly fitting lid.

As I was obliged to use an ordinary ice chest, the cultures were exposed to a somewhat varying temperature, but it did not rise above 24°C.

Blood for examination is removed by means of a platinum loop, great care being taken each time to prevent bacterial contamination. As the tubes employed were long and narrow, it was necessary to use a long, rather thick platinum wire instead of the ordinary loop with a holder.

Before removal of a drop for examination, the blood

[1] *British Medical Journal*, September 17th, 1904, page 648.

[2] *Quarterly Journal of Microscopical Science*, November, 1904.

is shaken up to mix the corpuscles and plasma thoroughly. This enables more satisfactory films to be made as well as ensures parasites being equally distributed. In good preparations the blood corpuscles remain unchanged for fifteen days or more: they cannot be distinguished under the microscope from the corpuscles of freshly drawn blood. The leucocytes show marked degenerative changes, and the nucleus becomes swollen and irregular. Nevertheless, in some cases, the variety of cell could be distinguished easily after several days.

Development.—Development of the bodies was observed in four cases. In one the preparation was examined every few days for a period of thirty-three days, at the end of which time the corpuscles were but little altered and no micro-organisms were seen in the films. The remaining cases, owing to the pressure of other duties, were not followed up so systematically, and in two of the cases commencing changes only, though of a convincing nature, were seen.

Case 1.—The patient had a greatly enlarged spleen reaching across the middle line of the abdomen and an irregular high temperature reaching to 102° F. and 103° F. at night. About ·75 c.c. of blood was removed from the spleen in the manner already described. In films made at the time of puncture parasites were fairly numerous. No clotting occurred, and when shaken up the blood retained for weeks a natural appearance.

Summary of Changes Observed.

There could be no doubt from this case that, under the conditions described by Captain Rogers, profound developmental changes in the bodies had taken place. These appeared to be of the following nature and order of sequence: enlargement together with changes in the large chromatin mass and the protoplasm, proceeding until the bodies are at least as large as a red blood corpuscle; fission occurring at least twice and forming groups of two and four large oval bodies loosely or not at all attached; formation of the vacuolic area and extrusion of the cement substance; flagellation of certain of the bodies, and the formation of numerous fission forms, many of which flagellate; finally, the formation of large groups of closely aggregate forms of various sizes. The time taken in this case for the different stages was as follows: large, fully-developed forms appeared by the fourth day; the vacuole, the extrusion of the cement substance, and the early stages of the flagella formation, all first appeared on the fifth day. Fully-developed flagella were not seen till the sixth day. Elongate flagellate forms were specially numerous on the sixth and seventh days. From the ninth day onwards the formation of masses of pear-shaped and irregular forms was the chief feature. Captain Rogers notes large forms on the second day and flagellate forms on the third day. He does not note any further stages than those seen on the fourth day, which correspond with those obtained by me on the fifth and sixth days.

Case 2.—The patient had a greatly enlarged spleen and an irregular high temperature. About ·25 c.c. of blood was obtained by spleen puncture. Bodies were rather scanty in a film taken at the time of puncture. In this specimen, after subsidence of the corpuscles, a slight clot formed in the plasma.

On the third day no development was noted. On the fifth day some large forms not quite so large as in the fully-developed bodies noted in Case 1 were seen. Most of the bodies had undergone little or no change. On the tenth day a good many quite unaltered bodies were seen, and some large forms at the same stage as those seen on the fifth day. Preparations were not again examined until the twenty-first day, when only one or two undeveloped bodies were noted. In this case development, although started, apparently failed to progress.

Case 3.—The patient had a greatly enlarged spleen and occasional slight rises of temperature. About ·25 c.c. of blood was obtained by splenic puncture. Parasites were fairly numerous in a film taken at the time. On the third day the culture was examined, but only a very few somewhat enlarged bodies were seen. On the tenth day fairly numerous forms with long flagella were seen. In this specimen the bodies were almost entirely free forms; a few groups were, however, present, and four or five bodies were often seen lying close together; a large proportion of the forms possessed flagella four or five times the length of the body of the parasite. The parasites were for the most part of an elongate pear-shaped form, and in many cases the extremity opposite to the flagellum was pointed, whereas the extremity from which the flagellum arose represented the thick end of the pear. In these forms, as in all those I have seen, the flagellum passed directly outwards from the small chromatin mass. A good many individuals showed small chromatin particles in addition to the two main masses. These were sometimes arranged in a row along one border of the parasite. In some of the more elongate forms there appeared to be large chromatin masses irregularly disposed, so that it was difficult to say which mass represented the macro-nucleus. Captain Rogers figures a similar condition in some of his forms.

In this case development had apparently differed somewhat in its nature from that seen in Case 1. This variability would appear also to have occurred in Captain Rogers' cases, since he describes on one occasion flagellate forms on the first day. In this connection it is worthy of note that in some cultures, although sterile, a much darker colour of the blood was seen than in others. It is, therefore, possible that all cultures may not be under precisely similar conditions.

Case 4.—The patient had a greatly enlarged spleen and an irregular high temperature. About ·5 c.c. of blood was drawn off by splenic puncture and placed in two tubes. The tubes were placed direct into a cool incubator at 22° C. On the fifth day some large characteristic bodies were seen resembling those seen in Case 1. The specimen was not examined later.

Although I have examined only a small number of cases, the results have been amply sufficient to corroborate the changes described by Captain Rogers. But, although the presence of a nucleus and well-marked blepharoplast and the development of a flagellum point to the bodies being a flagellate, I do not feel justified, either from my own observations or from an inspection of Captain Rogers' drawings, in stating

that they are *trypansomata*. The relation of the flagellum to the large chromatin mass, even in the very elongate forms, does not suggest that the characteristic arrangement met with in trypanosomes is in process of development. On the other hand, it cannot be denied that the forms bear a very close resemblance to some of the developmental forms seen in cultures of *T. Lewisi*, and further study must determine what relation, if any, exists between the new parasite and the *trypanosomata* of mammals.

COLONIAL CIVIL SERVICE.

Mr. Cecil Wray, District Officer of Kinta, South Perak, who has been acting for some time past as British Resident of Pahang, Federated Malay States, has been confirmed in that appointment. Mr. Wray entered the Public Works Department of Perak in 1881, and has since served in all parts of the various Malay States.

Mr. E. J. Brewster, District Magistrate of Lower Perak, who succeeds Mr. Cecil Wray as District Officer of Kinta, entered the service in 1878, and has already acted in the office to which he has been permanently appointed. He is also promoted to Class II. of the Federated Malay States Civil Service.

Mr. E. B. Wright, Barrister-at-Law, has been selected by the Secretary of State for the Colonies for the office of Chief Justice of the Seychelles, in succession to Mr. F. A. Herchenroder, who has been transferred to Mauritius as Procureur-General.

Mr. F. R. Winn-Sampson, Travelling Commissioner of Southern Nigeria, is officiating as Divisional Commissioner of the Eastern Division of the Protectorate.

Mr. F. Bisset Archer, Treasurer of the Gambia, has arrived in England on leave of absence. In consequence of the absence also of Mr. H. M. Brandford-Griffith, the Colonial Secretary, the duties of Colonial Secretary will be performed by the Governor, and those of Colonial Treasurer by Mr. T. E. Peirce, the Collector of Customs.

Mr. A. T. Dew has been appointed District Officer of Lower Perak, Federated Malay States. He was formerly in the Royal Navy, and in 1874 took part in the suppression of piracy on the Malayan Coast. In 1881, Mr. Dew became Magistrate and Collector of Perak, and subsequently served in the Straits Settlements, but returned to the Federated Malay States Service as a District Magistrate in 1888.

The Hon. F. A. Gibson, Collector of Customs and Registrar of Shipping, Mauritius, having left the Colony on leave of absence, Mr. Silas Graves has taken over the duties of Collector, and Mr. C. A. D'Avray those of Deputy Collector of Customs.

Mr. John Phillips, one of the Senior Superintendents of Civil Police of the Gold Coast Colony, has been promoted to the position of Assistant Commissioner of Police.

Mr. Claude Severn, Assistant Secretary to the Resident General of the Federated Malay States, acts as Federal Secretary during the absence on leave of Mr. A. R. Venning, who has come to England for six months. Mr. B. W. Elles, a Passed Cadet, acts as Assistant Secretary in place of Mr. Severn.

The death is announced of Mr. A. M. Walker, Assistant Conservator of Forests, Ceylon, who entered the service in 1885 and joined the Forestry Department after a special training in India, seven years later.

The Hon. Thomas Capper, Inspector of Schools, Jamaica, and Mr. David Balfour, Clerk of Courts, Kingston, Jamaica, will arrive in England next week on leave of absence.

Mr. W. C. Rae, Second Assistant Colonial Secretary of Mauritius, is to succeed Mr. L. Martin as Colonial Postmaster and Superintendent of Telegraphs of that Colony. Mr. Rae entered the Colonial Secretary's office twenty-nine years ago, and is the author of a work dealing with the constitution, practice, and proceedings of the Council of Government of Mauritius. Mr. Martin, the late Postmaster, has been connected with the Mauritius Civil Service for forty-six years, and has served in the departments of the Surveyor-General, Auditor-General, and Immigration Agent-General, and for the past fifteen years as Colonial Postmaster.

Mr. W. H. Lee-Warner, a Cadet of the Federated Malay States, has been selected for the office of Inspector of Schools, Negri-Sembilan, and Secretary to the Sanitary Board of Seramban.

Dr. R. Denman, Chief Medical Officer, Seychelles, has left the Colony on nine months' leave of absence, during which Dr. A. N. de Gruchy, the Assistant Medical Officer, acts for him.

The appointment of Mr. R. S. de Vere, District Commissioner of the Gold Coast Colony, has been terminated from May 17th, on the ground of ill-health.

Mr. J. R. Innes, Secretary to the Resident of Perak, acts as Senior Magistrate of Perak, and Mr. W. P. Hume, District Officer of Batang Padang, as Secretary to the Resident of Perak.

Mr. H. P. C. Strange, District Commissioner, Corosal, British Honduras, having left the Colony on six months' leave of absence, Mr. R. Wyatt, Assistant Superintendent of Police, performs the duties of his substantive office in addition to those of District Commissioner of Corosal.

Mr. J. S. Drieberg, Office Assistant to the Government Agent, Colombo, Ceylon, has been promoted to the office of Commissioner of Requests, and Additional Police Magistrate and District Judge of Colombo.

Mr. T. R. Bennett, jun., has been appointed a Junior Magistrate of Natal on probation.

Mr. H. Berkeley has been selected for the office of District Officer of the Perak New Territory, and has been promoted to Class III. of the Civil Service of that State.

Mr. W. Bowen Rowlands has undertaken the duties of Inspector of Mines in Selangor, Federated Malay States.

Mr. Laurence Lewton-Brain, Mycologist and Lecturer in Agriculture on the Staff of the Imperial Department of Agriculture for the West Indies, has accepted the appointment of Assistant Director of the Pathological Division of the Experiment Station

of the Hawaiian Sugar Planters' Association, and vacates his present appointment next month.

Mr. R. D. Anstead has been selected for the office of Superintendent of Agriculture in Grenada, West Indies.

Mr. W. M. Tutcher is acting as Superintendent of the Botanical and Afforestation Department of Hong Kong.

Mr. C. S. Davson, K.C., Solicitor-General, British Guiana, has been granted six months' leave of absence from the 14th inst.; Mr. N. R. McKinnon will act during his absence.

Mr. A. M. Pountney, of the Federated Malay States Civil Service, has been transferred to the service of the Straits Settlements as Second Assistant Protector of Chinese, Singapore.

Mr. W. Shankland, of the Audit Department, British Guiana, acts as Chief Clerk during the absence on leave of Mr. C. H. G. Legge, and Mr. T. A. C. Maskell as First Class Officer.

Mr. F. R. A. Browne has joined the Police Department of Trinidad as a Sub-Inspector.

Mr. C. A. Pollonais is acting as Assistant Receiver-General of Trinidad.

Correspondence.

THE INDIAN MEDICAL SERVICE DINNER.

TO THE EDITOR OF THE "JOURNAL OF TROPICAL MEDICINE."

SIR,—The Indian Medical Service Dinner was held at the New Gaiety Restaurant on June 8th, when there were forty-eight officers of that service of all ranks present, a healthy sign already manifest in the matter of the new regulations regarding leave.

Among the many bronzed faces of the Tropical workers who battle daily with the enemies of mankind far worse at times than the truculent Lushai or the wily Pathan along the Frontier of India, shone hoary heads, lustrous as the diamond, at the head of the table, in striking contrast to the rest of the company. Great veterans of the Navy, Army, and Civil Medical Services of this great Empire, whose paler features in comparison with the majority present, presented grand testimony of the work done, being still done, and waiting yet to be done in the interest of humanity. We one and all love to cherish the thought, with a feeling of pride, that the Scions of the House of Æsculapius may be crowned with hoary locks and still have the keen eyes of the diagnostician, and the sparkling and bright wit of the genius, and they speak of the grand victories achieved in the great field of medical and surgical science, never ending, ever progressing, but still young.

Such names as Sir Richard Douglas Powell, Mr. John Langton, Director-General Herbert Ellis, R.N., and Surgeon-General C. C. De Renzy have only to be mentioned to be known. It is into the hands of such that the country and the Empire may well place the destinies of the medical organisation and the health of the people with safety and security in Peace and in War, for they form a noble wreath around the profession to guard the Empire, Home, and King from the stealthy army of micro-organisms.

The Toast list was as follows :—

(1) "The King."

(2) "The Queen, Prince and Princess of Wales, and other members of the Royal Family."

Both the above were given most graciously by the Chairman, and enthusiastically drunk by all present.

(3) "The Sister Services" was proposed in affectionate terms and responded to in real earnestness by Surgeon-General De Renzy and Director-General Ellis respectively.

It was the misfortune of the hour when the latter announced the unavoidable absence of the Director-General of the Army Medical Department, and thus it fell to the lot of the representative of the Naval Medical Department to respond on his behalf, and who fitly described the linking and union of the Sister Services, and in a few touching remarks showed how seldom it fell to the lot of the Naval Medical Service to meet their colleagues in the Indian Medical, either abroad or at home, and although they seldom met, yet their interests in life were one. He also referred to the greater opportunities they had of meeting their Sister Service, the Army Medical, abroad and at home, and since the I.M.S. met the R.A.M.C. more frequently out in India, his high opinion was thus established. Surgeon-General Ellis, amid loud applause, took his seat, while the Sister Services should enjoy most excellent health for the manner in which their health was drunk.

(4) "The Guests" toast was then proposed by Surgeon-General Branfoot, C.I.E., whose free and easy manner and style characterised the speaker accustomed to speak in public life and at great Board meetings. To this Sir Douglas Powell, K.C.V.O., then rose amid deafening cheers, responding with his usual courteous and friendly, refined, gentle and deliberate, and most delightful manner so characteristic of the courtly gentleman. He referred in eulogistic phrases to the immensity of the work done by I.M.S. officers, and received a still greater cheer when he resumed his seat.

(5) Mr. John Langton, F.R.C.S. in his good humoured and right earnest style, with a merry twinkle in his countenance which improved our digestions immediately, made a humorous reference to the manner in which he found himself in the position he occupied; but he could not well understand how it was he was there; but as the Chairman had already cautioned him to say very little he would obey the injunction. He felt, he said, very much in the same position as the clinical assistant did before the physician, namely, that he knew very little about the case. Lieut.-Colonel Fryer had, however, on the previous Sunday, paid him a visit and given him certain material with regard to the I.M.S.,—first, that they served with the Military two years, then were lent to some Native Chief, a potentate, and so forth; but he said such a deal in so short a time that he had quite forgotten it all. (Loud laughter.) I am sure Mr. Langton's brief speech did us all much good, for with the help of cigars, we were now beginning to feel an improvement in our pulsations. Mr. Langton took his seat amid thundering applause. Just then even the skies wept bitterly at the brevity of his speech, which of course was under strict injunctions, and not an unconscious bit of witticism on his part.

THE INDIAN MEDICAL SERVICE.

The Chairman, Surgeon-General Cleghorn, C.I.E., then rose to propose the above toast, and covered much ground in recording the traditions and work of a service in which he had been Director-General. Among other workers he referred to the benevolent and noble act of a surgeon in the earlier days of the Honourable East India Company, who, because of the unselfishness and magnanimity displayed to his country and countrymen had immortalised the Medical Service in India. The great name of Broughton will ever shine illustrious in the pages of Anglo-Indian history, for when, we are told by Surgeon-General Cleghorn, he was asked by the "Emperor Shah Jehan" to name his fee for curing his daughter, he (Broughton) merely asked that his countrymen should be allowed a plot of land to build factories upon and trade with India, instead of the fee. This was granted, hence Calcutta has grown up ever since as a great commercial city in the East. I (G. H. F.), would like, however, to make a small correction with regard to the Emperor who did this. It was not "Shah Jehan," but Jehanju, a contemporary of James the First of England. Both the Emperors (Jehanju and James I.) launched a royal decree

against the use of tobacco, then recently introduced into India and England.

Surgeon-General Cleghorn then described the multifarious duties of the Civil Surgeon who was also Superintendent of Jails among other things, and was expected to "make bricks without straw," thus showing that the *origo mali* of the whole system was based on false economy, and the I.M.S. officers who worked hard, under great difficulties and amid opposition and prejudice, among a mysterious people in a foreign land, suffered, since efficiency and good work were sacrificed for economy merely. He also described the unique opportunities the I.M.S. had in India for scientific research.

Lt.-Colonel Freyer, who was called upon for a speech, said that he found himself in the most enviable though unfortunate position of having to drink to his own health; but, that as he came from Erin's Isle, he felt he was quite capable of undertaking such a task.

In the course of his remarks, Colonel Freyer spoke on that familiar and modest topic of private fees in India from native chiefs and noblemen, recounting at the same time the allusion made by Surgeon-General Cleghorn with regard to that great Surgeon Broughton's magnanimous conduct in merely asking for a concession instead of a fee which would have enriched his coffers. In dealing with the "morality" of the service since those days, he stated in a somewhat good-natured and jocular fashion how another surgeon of the Indian Medical Service in recent times, when offered a large fee from a native chief had the "bad taste" to take it, and bank it in the "Bank of Bengal." He felt that such a bank did not exist in the days of Broughton for him to have done what he did.

G. H. Fink, Major I.M.S. (Retd.), M.R.C.S., L.S.A.
12, *Fairfax Road, Bedford Park, W.*
June 13th, 1905.

TO THE EDITOR OF THE "JOURNAL OF TROPICAL MEDICINE."

Sir,—I notice that in the Journal of Tropical Medicine of March 1st you credit me with the statistics submitted as to Cyprus; this is incorrect, as I merely supplied the statistics, *with report*, having reference to the District of Larnaca. Reports and statistics from the six districts of the Island are forwarded to the Chief Medical Officer (F. C. Heidenstam, C.R.G.), who compiles them and forwards the result to England.

I am,
Yours faithfully,
George A. Williamson.

Larnaca, Cyprus,
March 17th, 1905.

Notes and News.

Bacteriology of the Desert.—Engel states in the *Zeitschrift für Klinische Medizin* that, in the neighbourhood of Helouan, Egypt, the average number of germs in 100 litres of air was 28. So small a quantity is only found in the polar regions and on the high seas. None of the germs were pathogenic to animals.

Beri-beri in Hong-Kong.—According to the report of the Principal Medical Officer, beri-beri prevailed in Hong-Kong during 1904 to a markedly increased extent compared with the previous year. In the Civil and Tung Wah Hospitals 812 cases of beri-beri were admitted during 1904 against 313 during 1903. Of the 724 cases admitted to the Tung Wah Hospital 329 proved fatal. All the patients suffering from beri-beri were Chinese. The Government in Hong-Kong have deputed two of its officers, Dr. Hunter, the Government bacteriologist, and Dr. Koch, one of the colonial medical staff, to investigate the ætiology of the epidemic. It is satisfactory to know that the enquiry has been placed in the hands of men so well qualified to deal with the question.

Standardisation of Disinfectants.—It is satisfactory to note that the process of standardisation of disinfectants is progressing. In the tender for disinfectants recently issued by the War Office the following condition appears:—"The contractor guarantees that tested against *Bacillus typhosus*, taking carbolic acid as the unit, the disinfectant will give a co-efficient of not less than ——. (The contractor to insert the exact co-efficient.)

Nursing in South Africa.—It is intended to establish a Nurse's Association in Natal. In up-country towns in Cape Colony nurses are wanted, but it would be well for nurses to secure an appointment before going out.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the Journal of Tropical Medicine *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"The Journal of State Medicine," April, 1905.

Ankylostomiasis in Westphalia and Hungary. T. Oliver.

In Westphalia in one year alone 20,000 miners were introduced. These men came from East Prussia, from Poland, and from Italy. At present Italian miners are accepted, if they satisfactorily pass the doctor's examination, but under no circumstances is a miner from Hungary received. Within the last two years ankylostomiasis has cost £100,000. It is believed that it was brought from Hungary, its spread being due to the compulsory use of water sprays, which were introduced in consequence of the explosions that occurred in the pits through coal dust.

In the valley of the Ruhr the number of cases was 1,030 in 1901, and 1,355 in 1902. At present no man can be employed at any mine until he has presented a medical certificate. At Bochum, during 1903, the patients treated for ankylostomiasis numbered 3,000. At the Lothringen Colliery 4,000 have been treated since 1894; two years ago 72 per cent. of the men were affected. Recently only 8 per cent. were ill. If 6 per cent. of the men employed in any pit are found to be suffering from ankylostomiasis, that mine is regarded as infected. Formerly the men objected to be treated for the disease, because they received only a minimum salary when off work, but, now, owing to full wages being paid to infected miners, the good feeding in the hospitals and the rest from work, men would come to the doctor bringing with them a jar containing the

fæces of a comrade whom they knew to be infected, in order that they might be allowed to go into hospital. At the present time every miner who is suspected or who looks anæmic is obliged to pass his fæces in a special lavatory into a jug provided for the purpose, and under the vigilance of a mine official.

At the Sopron-Brennberg Colliery, Hungary, seven years ago, upwards of 90 per cent. of the miners were affected by the worm; at the present time about 30 per cent. of the men are suffering from ankylostomiasis. A few years ago, when the mine was more infected than now, the men suffered considerably in their health. They were extremely anæmic, and so ill that they could not follow their employment; their feet were swollen, and the men on the slightest exertion became so short of breath that many of them could scarcely walk. By degrees the virulence of the epidemic subsided, so that new patients do not suffer so severely as the miners of a few years ago.

The temperature of the Sopron Colliery is in places high—104° to 108° F. (40° to 45° C.)—but if the heat is not lowered by sprays of water it may rise to 173° F. (80° C.)

Throughout the mines there are cisterns filled with water and compressed air at a pressure of 30 atmospheres, and these are turned on, now and then, to cool the mine.

When the disease affects for the first time a mine, the men who become infected generally suffer rather severely. As time goes on, either the men become more resistant to the ravages of the parasite, or the worm itself becomes less virulent, for occasionally at a *post-mortem* examination there may be many ankylostomes found in the intestines without any grave symptoms having been detected during life.

The disease might be prevented (1) by making the mines healthy, but it is not always easy to render a damp mine dry, and it is often difficult to reduce the temperature; (2) by prohibiting infected men from working underground; and (3) absolute prohibition of the miners defæcating underground unless into the receptacles provided for that special purpose. Means should be taken to screen off these receptacles in the mine, and the men should be encouraged as far as possible to use the closet accommodation provided for them at the pit-head.

The recent regulations of the Austrian Minister of Agriculture should do much to prevent the spread of the disease in Hungary. New miners must pass a medical examination (three samples of dejecta being examined under the microscope), and in the case of an infected mine 10 to 20 per cent. of the underground staff must be examined microscopically. This requires great care and special experience, as rhabdites are often with difficulty differentiated from the larvæ of ankylostoma. The sludge in various parts of the workings must also be examined. Miners who have been infected and treated must produce a medical certificate of freedom from the disease before again being allowed to work. Each working colliery must provide suitable closet accommodation above ground and below ground, one cabinet for every thirty men of the staff; but at infected or suspected mines the number of cabinets must be not less than one to every twenty men of the total staff. The receptacles must be emptied and disinfected daily. A proper supply of drinking-water in closed vessels must be provided for the men, changed once a day, and the taps so arranged as to prevent direct drinking from the spouts or contamination by dirty hands. These regulations will do much to prevent the spread of ankylostomiasis in Hungary, and it is hoped may ultimately lead to the disappearance of the disease.

T. P. B.

"California State Journal of Medicine," April, 1905.

Uncinariasis: Report of Seven Cases. By H. Gunn, San Francisco.

"Brooklyn Medical Journal," April, 1905.

Elephantiasis of the Scrotum. By W. F Campbell.

EXCHANGES.

Annali di Medicina Navale. Annali d' Igiene Sperimentale Archiv für Schiffs u. Tropen Hygiene. Archives de Medicine Navale. Archives Russes de Pathologie, de Médec. Clinique et de Bacteriologie. Australasian Medical Gazette. Boletin de Medicina Naval. Boston Medical and Surgical Journal. Bristol Medico-Chirurgical Journal. British and Colonial Druggist. British Journal of Dermatology. British Medical Journal. Brooklyn Medical Journal. Caducée. Climate. Clinical Journal. Clinical Review. Giornale Medico del R. Esercito. Hong Kong Telegraph. Il Policlinico. Indian Medical Gazette. Indian Medical Record. Indian Public Health. Interstate Medical Journal. Jahresbericht. Janus. Journal of the Royal Army Medical Corps. Journal of Balneology and Climatology. Journal of Laryngology and Otology. Journal of the American Medical Association. La Grèce Médicale. Lancet. Liverpool Medico-Chirurgical Journal. Medical Brief. Medical Missionary Journal. Medical Record. Medical Review. Merck's Archives. New York Medical Journal. New York Post-Graduate. Pacific Medical Journal. Polyclinic. Public Health. Revista de Medicina Tropical. Revista Medica de S. Paulo. Sei-i-Kwai Medical Journal. The Hospital. The Northumberland and Durham Medical Journal. Transactions of the American Microscopical Society. Treatment. West India Committee Circular. West Africa.

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Original Communications.

REPORTS OF THE COMMISSION

APPOINTED BY

THE ADMIRALTY, THE WAR OFFICE, AND THE CIVIL GOVERNMENT OF MALTA,

FOR THE INVESTIGATION OF

MEDITERRANEAN FEVER.

PART II.

LONDON: HARRISON AND SONS, ST. MARTIN'S LANE,
PRINTERS IN ORDINARY TO HIS MAJESTY.

Price Two Shillings.

APRIL, 1905.

REPORT UPON THE GENERAL SANITARY CIRCUMSTANCES OF THE MALTESE ISLANDS, WITH SPECIAL REFERENCE TO THE PREVALENCE OF MEDITERRANEAN FEVER THEREIN.

By Dr. RALPH W. JOHNSTONE.

Medical Inspector Local Government Board.

ABSTRACT.

BRIEF DESCRIPTION OF THE MALTESE ISLANDS.

THESE islands include Malta, Gozo, Comino, and Cominetto. The two latter are islets, and, save for the hospital for exotic disease on Comino, with its caretaker, are uninhabited.

The island of Malta is about 17 miles long by 8 wide, having an area of 91 square miles. In 1901 the resident population was 176,127.

Gozo is about 9 miles by 4½, with an area of 26 square miles. Its population was 20,002 in 1901.

Both islands are covered by low hills, which, with their intervening valleys, leave little or no flat surface. Every available inch of land is cultivated, but the fields are shut in by high stone walls, which gives the country its characteristic stony and sterile appearance. There are no rivers.

Geologically the formation is an Upper Coralline limestone, under which are successive beds of greensand and marl, overlying a Globigerina limestone (often locally called calcareous sandstone), which again overlies a Lower Coralline limestone. Practically, all the inhabited part of Malta is denuded down to the Globigerina limestone, with occasional outcroppings of the Lower Coralline formation, and one or two patches of alluvium. The north-western and more elevated part of Malta is, however, covered by the Upper Coralline limestone, as is also the higher ground in Gozo.

PART I.—GENERAL SANITARY SURVEY OF THE MALTESE ISLANDS.

Density of Habitation.—The population enumerated on land at the census of 1901 showed an average density of 1,671 persons to the square mile, or in Malta 1,926 to the square mile, and in Gozo 775.

Dwellings.—All the dwellings are constructed of stone, generally in two storeys with a flat roof, which is utilised to collect rain-water. The flooring of rooms is generally constructed of porous stone, which forms a fine dust with surface wear. Rabbits, hens, cats and dogs are kept in the houses, and sheep and cattle are housed in outbuildings, which usually abut on the dwelling-house.

Excrement Disposal.—The method most generally employed is what is known as the hand-flushed water-closet. It is placed sometimes in the open yard in a niche in the wall, frequently in the kitchen a foot or two from the cooking apparatus, or it may be in a small cupboard (1′ × 2′ usually) in the external wall of the house, or in the steps leading to the entrance hall from the front door, and sometimes even in the open street. It is very exceptionally found in a special room or in a position where it is likely to be used in the usual manner. In those poorer class houses which have got a special room for the water-closet, the room serves often also as a larder or food store. The hand-flushing of these closets is conspicuous mainly by its absence. They are usually caked with filth, and the surroundings fouled with fæcal matter.

The next most frequent method is what may be called the misbla system. A misbla is a dung-heap, and it may be placed in the garden or yard, or more frequently in an outhouse adjoining the living rooms, or in an ordinary room in the house. Here all the excrement of the family is carefully preserved for removal to the fields. On one occasion on asking to see the vessel used for conveying excrement to the garden, I was shown the bucket in which the vegetables for the family dinner were being washed.

The military and naval latrines, or "heads," on board ship are of a better pattern.

Public urinals sometimes have no water supply, and thus become very offensive.

House Refuse Disposal.—There is no regular system for collection of house refuse in Malta. Ashpits or bins are almost unknown. Refuse is thrown into the garden or into the street.

Sewers.—The sewers in the villages which have existed for centuries are built of or cut in the porous rock, being more in the nature of galleries than sewers, and they are not in any way rendered impervious. They act as elongated cesspools where the liquid sewage gradually soaks away into the rock, leaving a semisolid residue.

Cesspits, in the case of new houses, are built under the street and are ventilated and cemented. In the old houses the cesspits are often under the dwelling-rooms and unventilated. Very frequently they are placed close to the water-tanks.

Water Supply.—There is a public water supply laid on to every village in Malta except Mellieha. The water is derived from groups of springs in three different localities, which afford an approximate mean daily yield of 418,500 gallons by gravity. In addition, there are three other sources from which potable water is pumped, the mean daily yield being about 693,000 gallons. Besides the drinking water there is a brackish water found at Armier, and pumped to Valletta, where it is used for watering streets and flushing sewers. The main storage reservoirs for drinking water are at Ta Kali, near Attard, and are capable of holding 16,865,200 gallons. The total storage capacity of the island is 18,980,000 gallons. The gathering grounds for the water supply are for the main part in thinly populated portions of the island. The water is

collected in galleries driven in the rock deep below the surface, and conveyed by iron pipes to the tank or pumping-station. From there it is distributed by cast-iron pipes or by stone channels built in and lined with cement. The water is usually distributed by means of stand-pipes in the villages. In Valletta the houses generally have taps, but they are often without them, and outside the area surrounding the harbours taps are seldom found in the houses. In some villages there are large underground tanks provided by the roadside, which are filled in the winter from the public water supply. These tanks are seldom fitted with pumps, and in consequence become very foul from the constant lowering into them of buckets which have been allowed to stand on the roadside. The vicinity of pervious cesspools provides a possibility of pollution which is often present.

Practically every house in Malta has underneath it a large tank for collecting rain-water from the roof. The contents of these tanks very often show signs of pollution, nor can this be wondered at when it is considered that the roof is very much used by the family in summer, and by their cats and dogs. Tanks are never supplied with pumps, and the bucket which is lowered into them by a rope is often placed on the yard flags amidst slop water and pollutions due to animals or to the neighbouring water-closet. There are very few wells in Malta.

In Gozo the public water supply is obtained from similar sources to that of Malta, the total mean daily supply amounting to about 143,000 gallons, derived from three principal sources. About 90,000 gallons of this water, coming from two sources, is brackish, and about 50,000 gallons, coming from the other source, is good water. The two qualities are mixed before distribution, and the result is a water containing considerable quantities of magnesium salts, which is likely to affect new comers prejudicially.

Notification of Infectious Disease.—There is no payment for notification, and though there is a penalty for neglect to notify it is difficult to exact, and in point of fact never has been exacted. Many considerations interfere with the accurate notification of Mediterranean fever.

A Maltese medical man of experience stated that he did not think more than a third of the cases of Mediterranean fever that occurred in Malta were notified, and not more than a fifth of those in Gozo.

Isolation.—Mediterranean fever is not isolated.

The usual source of milk in Malta is the goat. These animals are driven about the streets in flocks, and are milked at the customer's door into his own vessel. The udders, which are abnormally large, often touching the ground, are very liable to be soiled. The proprietors of herds are so many that it is always difficult to ascertain from a householder where he has got his milk. No regulations are in force for the effectual control of these vendors.

The regulation against throwing refuse and offal into the streets is not enforced, or very feebly so.

Part II.—Mediterranean Fever.

The study of Mediterranean fever virtually commenced by Marston's paper in 1861, and received its great impetus from the discovery of the *Micrococcus melitensis* by Bruce in 1887.

In 1897, Wright and Semple, by introducing the serum agglutination test, placed matters on a more exact basis. This method was in 1900 adopted as a routine practice in the Army, and shortly after in the Navy.

Since the publication of Hughes' book in 1897, Mediterranean fever has attracted considerable attention in the Army and Navy, and much has been written about it.

The Geographical Distribution of Malta Fever.

The following list of places from which Mediterranean fever has been reported is taken, with slight additions, from the *Journal of the Royal Army Medical Corps*, vol. ii., No. 4: *Spain*—Gibraltar; *Islands of the Mediterranean*—Balearic Islands, Corsica, Sardinia, Sicily, Malta, Gozo, Cyprus, Crete; *Italy*—Rome, Naples, Caserta, Benevento, Campobosso, Aricca, Terano, Fermo, Padua, Cittanova, &c.; *Greece*—Athens, Cephalonia; *Turkey*—Constantinople, Smyrna; *Palestine*—Jerusalem; *Africa*—Tunis, Algiers, Alexandria, Suakin, Massowah, Zanzibar, Kimberley (?); Aden; *India* — Calcutta, Mian Mir, Nowshera, Secunderabad, Simla, Delhi, Lucknow, Agra, Allahabad, Choabattia, Subatha, Assam, Swat Valley; *China*—Hong Kong, Philippine Islands, Fiji Islands; *North America*—Mississippi Valley; *West Indies*—Cuba, Puerto Rico; *South America* — Venezuela, Brazil, Monte Video.

This list will probably undergo considerable enlargement and alteration in the future.

Hitherto, Mediterranean fever has not been reported north of 45th parallel or south of the 40th.

Incubation Period.—The usual incubation period of Mediterranean fever is not more than eight or ten days.

It may be provisionally stated that the data available tend in some degree to suggest that the incubation of Mediterranean fever ranges about a period of fourteen days.

Distribution of Mediterranean Fever in the Maltese Islands.

Mediterranean fever occurs in every part of Malta and Gozo, on the sea-coast and inland, though as a rule its relative incidence is less severe in the villages more remote from the capitals.

Comparing the three areas for the period 1894 to 1903, it appears that the average number of cases of Mediterranean fever per year per 10,000 inhabitants was:—

(1) Urban drained area	18·8
(2) Suburban undrained area	41·8
(3) Rural area	33·4

It appears that when Mediterranean fever attacks the crew of a ship one year, it is very likely to attack the crew of the same ship in each of the following years that she remains on the station. There is little relation between the number of days spent by a ship in Malta and the number of cases of Mediterranean fever which occur on board her.

Age.—The facts seem to point to the ship herself becoming infected, and in some way assisting in the transmission of infection. Of course, the larger the crew the greater the chance of infection being introduced into the ship from outside.

From the figures of the two years 1902 and 1903, it would appear that men under 25 years of age suffer more than the average number of attacks per 1,000. From 25 to 40 there is a degree of immunity becoming less with advancing years. Over age 40 the incidence again becomes severe. The deaths are too few to permit of any useful deductions being made from them.

Length of Service in Malta.—The heaviest incidence of Mediterranean fever is upon men with less than one year's service; in fact, they are the only class shown with an incidence greater than the average incidence of the disease upon all classes taken together. The incidence upon men with over two years' service is less than half that upon men with under two years' service, and the severity of incidence continues to decrease with length of service up to five years, after which it again rises.

The Case Mortality.—Amongst the civil population of Malta, 8·9 cases per 100 attacked died during the period 1894 to 1903, and amongst the civil population in Gozo, 8·4 per 100 attacked died during the same period. In the Army, during the period 1897 to 1903, the case mortality was 3·2 per cent., and in the Navy it was only 1·4 per cent. during the period 1897 to 1901.

Temperature and Rainfall in Connection with Mediterranean Fever.—There is a very close correspondence between the temperature and the number of cases. The temperature attains its maximum in July and continues high during August, after which it begins to drop.

The rainfall attains its minimum in July, but it is almost as low in June and August. The "case" curve commences to drop at the same time that the rainfall curve commences to rise, allowing no interval for incubation and notification, so that the connection is not clear; nor does the steep rise of the rainfall curve at the end of September produce a correspondingly steep decline in the case curve as might have been expected were the connection between the two intimate.

The maximum prevalence of Mediterranean fever would appear to be in the month of August, and the minimum in February.

From February to August there is each month a steady increase in the number of cases, except for a slight drop back in April, and from August to February a steady decrease.

Consideration of Ways in which the Infection of Mediterranean Fever may be Transmitted.

(1) *Direct personal infection* (that is, by contact, or by the breath, or by the saliva).

Amongst 100 houses which were visited, in all of which Mediterranean fever had been notified during 1904, in six only had there been more than one case notified.

The cause of special incidence of Mediterranean fever in the hospitals does not on the evidence obtained appear to be direct personal infection, since that would probably be more evident in the hospital where least isolation is attempted. Neither is the evidence in favour of a place infection, to which the patients would probably be more exposed than the staff, and would, in addition, constantly present fresh material.

(2) *Excretal infection* may occur by means of infected dust inhaled or swallowed, by contamination of the hands, and thence the mouth, or by contamination of food or drink.

Dust is very prevalent out of doors in Malta because of the friable nature of the rock and the hot sun, and owing to the high winds prevalent, opportunity of inhaling or swallowing it is present during the greater part of the year.

The observations in this direction, however, do not indicate that contaminated dust in the open air has a marked influence upon the incidence of Mediterranean fever.

Abundant opportunity for soiling the hands and for pollution of the food is afforded by the methods of excreta disposal in use in the islands. The evidence is in favour of the probability of excretal pollution of the hands or food, or of dust inside houses having played a part in the spread of infection. As against this probability there is the fact that amongst the civil population, where opportunity of this kind of infection is far greater than amongst the garrison or Navy, the case incidence of Mediterranean fever is in general about one-eighth as severe. Here, however, the notification returns are probably at fault.

(3) *Newly-turned earth* has been suspected by more than one observer to be a cause of outbreaks of Mediterranean fever. When the porous nature of the rock in Malta is considered together with the fact that sewage has been allowed to percolate into it and into the soil above it for centuries, it does not seem remarkable that digging operations should have been suspected.

It would not seem, however, that opening streets to lay sewers or digging in the porous soil has any marked effect in increasing the prevalence of Mediterranean fever.

(4) *Biting Insects.*—The researches of Shaw and Gilmour would show that it must be a matter of some difficulty for a biting insect to infect himself from the human subject, seeing the sparse numbers in which the micrococcus has been found in the peripheral circulation, and the small amount of blood the insect is capable of taking. Similarly, the chances would be infinitesimal of an insect carrying even a single *Micrococcus melitensis* mechanically upon his proboscis. On the other hand, it may be said that if certain biting insects like mosquitoes were capable of infecting themselves with Mediterranean fever and of transferring the infection, the disease would be much more prevalent than it is.

(5) *Water* does not appear to have played any considerable part as a carrier of Mediterranean fever infection in Malta.

(6) *Milk* is not so closely connected with water in Malta as it is in most other countries, because the great majority of people get their milk supply in their own vessels direct from the goat.

(7) *Uncooked Foods.*—Enquiry was made in a large

number of cases with regard to fruits and vegetables, or salads, but nothing tending to incriminate these articles of diet was elicited.

(8) *Infection by Cuts or Abrasions.*—No connection was established between breaches of continuity in the skin and subsequent attacks of Mediterranean fever.

CATARACTS AND SECONDARY CATARACTS AND MEMBRANOUS OPACITIES OF THE VITREOUS.

By Major G. H. Fink, I.M.S., M.R.C.S., L.S.A.

In December, 1894, I read a paper before the Indian Medical Congress in Calcutta on the "Treatment of Certain Cases of Impairment of Vision after Cataract Operations Performed with Success," and which paper comprised Part II. of my *brochure* on the "Methods of Operating for Cataract and Secondary Impairments of Vision, with the Results of Five Hundred Cases," published in 1894 by Messrs. J. and A. Churchill, of London.

This part of my work was published in p. 173 of the *Transactions of the First Indian Medical Congress*, and I would draw attention to the following points in Part I. of my book first, before taking up the point regarding membranous opacities:—

(1) The question of iridectomy is discussed in p. 18.

(2) The question as to whether the capsule of the lens should be pricked or not is dealt with in pp. 21-22.

(3) The last stage in the coaxing out of the lens is given in pp. 22-26.

There are two points connected with my operation for cataract which during my experience I found most useful, namely (*a*) the nature and position of eye speculum; (*b*) the irrigation of the anterior chamber of the eye with a 1 in 10,000 perchloride of mercury solution, which I employed. These two points are given in p. 12 and p. 23 of my *brochure* on cataract above mentioned.

I mention them, because since my work has been published, I observe that Elliot of Madras, and another operator of the eye, have mentioned these points as if they were original discoveries made by them respectively.

With regard to the question of iridectomy or non-iridectomy, and the extraction of cataract either whole in its capsule or by laceration of the capsule before extraction is done, I can only affirm what I have already said with regard to these points in the pages above referred to, and I can only repeat that these measures in India and in Great Britain are decided by the merits of each case, and in this I am, I feel, largely supported by the majority of operators of any great experience. With regard to Indian operators of experience, I would ask reference to the remarks in p. 179 of the *Transactions of the First Indian Medical Congress*, by M. G. Naidu, of Madras, and C. Mitra, of Kashmir, since from their opinions it will be observed that racial influence and habits, with dietary, have a strong bearing on the nature of the cataracts in the West and East respectively; hence the treatment by preliminary iridectomy and capsulotony are decided upon by the merits of the case before you for operation.

With regard to the point of membranous opacities of the vitreous, I would desire to say, that when I read my paper before the Medical Congress in Calcutta I had performed over 1,000 operations for cataract, which, I need hardly say, would entitle me, therefore, to make my remarks with certain authority. I would draw attention once again to the point given in p. 63 of my *brochure* and p. 176 of the *Transactions of the First Indian Medical Congress*, and the measures adopted in the treatment. Such opacities are termed "secondary cataract" by Swanzy, who states: "The term secondary cataract is also used in cases in which, after a cataract extraction, the capsule of the crystalline lens which is left behind presents an obstacle to good sight." (The hyaloid membrane and capsule were considered identical membranes then.)

Moreover, although it is generally thought that "membranous opacities," which are occasionally seen in the vitreous, are hardly ever amenable to treatment, yet Von Graefe in such a case "tore through a membranous opacity with a good result." "Let sleeping dogs lie" may be an axiom to be followed with advantage in most cases, and yet in a small percentage, such as 2½ per cent., cases of cataract operations, where the operation has been performed with perfect success, and vision (which is tested with fingers before the patient's eye to count in India) is absent, justifies the procedure I have adopted with success. We are told that "recently this operation has, however, been repeated in several cases with encouraging results."

I had the misfortune of being criticised unfavourably by a member of the I.M.S. at the Medical Congress at Calcutta, when I read the paper there, who had, I afterwards learnt, performed about 100 operations only for cataract. The Sectional Editor of that Congress, in the Surgical and Ophthalmological Section, reported, with regard to the remarks made by this speaker, that "he was of the opinion that in these cases the cataract was immature. In extraction some transparent layers had been left behind and escaped notice." I maintain that the results I had in the North-west Provinces and Oudh would themselves affirm that all operations for cataract performed by myself were done by eclectic methods and strictly under antiseptics, with irrigation of the anterior chamber, so that the criticism in the face of these facts and the above confirmation quoted, show that Major F. P. Maynard, I.M.S., then was not fully qualified nor justified in making such an unfair criticism, when his experience was practically *nil* in such cases as compared with men who had done their 1,000 cataract operations. I trust that he has had reason to alter his views since, for, with wider scope and better opportunities, I feel sure he will come across such cases in the North-western Provinces, if not in Calcutta, which I learn is to be the future field of his work, and I can only say, I wish him and his patients every success. I have been obliged to publish this, as the remarks in my reply to Maynard were not published in the *Transactions*.

Before closing, I would desire to point out that, in a review of my *brochure* on cataract in the *American Journal of Medical Science*, Fox, of Philadelphia,

had been working, we are told, at this same matter as I had written upon, about the same time.

I trust Major Maynard will excuse my drawing attention to a matter in which it was considered best at one time to "let sleeping dogs lie," but which recently has been awakened because of the encouraging results, and I think I have succeeded in awakening some interest in these dark little points in the eye.

ON THE CLASSIFICATION AND PATHOLOGY OF BERI-BERI.

By Hamilton Wright, M.D.(McGill).

Abstract No. III.

Classification of Beri-beri.

Acute Pernicious Beri-beri, in which the onset is sudden, with more or less severe symptoms of gastro-duodenal irritation and cardiac paralysis. There may be varying degrees of pulmonary, vaso-motor and sensori-motor paresis. On first examining a case in this class it may generally be predicted that death will shortly occur.

Acute Beri-beri, in which the onset is sudden, though never so sudden as in acute pernicious beri-beri, with more or less noticeable symptoms of gastro-duodenal irritation and concomitant vaso-motor and sensori-motor paresis.

Subacute Beri-beri, in which the onset of the disease is more insidious than in either of the above classes of cases; in which the symptoms of gastro-duodenal irritation may escape notice, and in which the concomitant sensori-motor and vaso-motor paresis may be so slight as to involve only one or two movements, a few areas of sensation and the vascular supply to the front of the legs.

Beri-beric Residual Paralysis or Neuritis, or the disease as it appears after the symptoms of gastro-duodenal irritation have disappeared, and after the causal organism and its toxin have accomplished their work and been eliminated. Our *post-mortem* statistics of the disease and the major portion of our clinical observations are based on this class of cases.

Acute Pernicious Beri-beri.

Clinical Summary.—The onset in this class of cases of beri-beri is generally sudden, and those attacked are amongst the lustiest of their fellows. A premonitory syndrome, suggestive of gastro-duodenal irritation, is marked. A man who yesterday would have attracted attention because of his fine physical condition will to-day complain of loss of appetite or of a dislike of solid food. In the Kuala Lumpur Gaol, where beri-beri had long been prevalent, and where cases could be watched from the initial stage of the disease, I found that a complaint of loss of appetite and a request for *congée*, or rice porridge, were the precursors of more marked symptoms of gastro-duodenal irritation. Within a few hours, never more than twelve or fourteen, a dull pain or a never clearly described dull, oppressive feeling would be complained of, and referred to the epigastrium. There would be also complaint of a heavy, sickish feeling in the stomach. Deep pressure of the epigastric region intensified all of the sensations referred to it. Almost immediately following the onset of the epigastric symptoms the epigastrium would begin to more or less distinctly bulge. The throat would be found moderately congested. Fever might be complained of. I was not, however, able to verify its presence.

At the onset of the attack, and while the epigastric sensations occupy the patient's mind, it is rare for him to complain of anything that would indicate an impending disturbance of nerve function. If, however, a careful examination is made, it may generally be demonstrated that there are areas of anæsthesia or hyperæsthesia over the distribution of the cutaneous branches of the anterior tibial and musculo-cutaneous nerves in the legs. The irritability of the anterior tibial and peroneal muscles to the interrupted and continuous current is altered, and the knee-jerks are greatly exaggerated. The latter are decidedly minus or altogether absent. Perhaps a sensation of pins and needles or as of ants crawling in the skin of the dorsa of the feet or of the front of the legs may be complained of.

In all cases of this class, however, early, sudden intimations are given which declare the action of the beri-beric virus on the entire cardiac nervous system. Even within twelve hours the heart proclaims its release from nervous control. The vessels in the neck, the larger arteries in the limbs and the epigastrium throb violently and perhaps irregularly. An irregular, massive wave sweeps over the precardiac area or even over the whole chest with every beat of the heart. Various hæmic murmurs are audible at the apex. The slightest exertion on the part of the patient causes the pulse to rise rapidly in time and to become irregular. The heart, especially the right side, becomes greatly dilated, the lungs give signs of engorgement, shortness of breath follows, and the patient passes to death through an agony distressful to see. It is always a surprise to observe that patients are mentally clear up to a few moments of dissolution.

Pathological Summary.—The external appearance of the cadaver of a case of acute pernicious beri-beri depends largely on the amount of œdema which developed before death. A general anasarca will mask other signs. In cases where there has been but moderate œdema the veins in the neck are found swollen. Various degrees of *post-mortem* ecchymosis are present. If the death agony was of long duration *rigor mortis* sets in early. The eyes are found partially closed, the fingers contracted, and there may be a blood-stained foam on the lips. The throat is generally found reddened. On opening the abdominal, pleural and pericardial cavities a varying amount of clear straw-coloured fluid is found. The stomach and upper part of the small gut are seen to be moderately dilated and empty. The walls of these parts are toneless. The gastro-duodenal mucosa may be moderately congested, or exhibit an angry inflammation or hæmorrhagic erosion. In all cases the pyloric end of the stomach and the valvulæ conniventes of the duodenum are the seat of discrete or more or less confluent hæmorrhagic extravasations. On the other hand, actual extravasation may be absent, and then the

crests of the valvulæ conniventes are deeply injected. Where extravasations are numerous and confluent, or where hæmorrhagic erosion has occurred, a thin pellicle of blood-stained mucus can be stripped from the underlying mucosa. I have not, however, observed a diphtheritic or a pseudo diphtheritic membrane. The inflammation may extend to the jejunum. In two cases I have observed extensive inflammation as low as the cæcum. As a rule, the changes are confined to the duodenum, the upper few feet of the jejunum and the pyloric end of the stomach. Microscopically the affected parts of the gastro-duodenal walls exhibit the main features of an acute inflammatory process. There is active congestion, small-celled infiltration, cloudy degeneration and necrosis of the lining and glandular epithelium of the mucosa. Mast cells are present in unusually large numbers; polymorphonuclear leucocytes are always present in the mucosa and submucosa. The nuclei of Auerbach's and Meisner's plexuses are generally swollen and exhibit various degrees of eccentricity. Transcurrent nerve-fibres in the walls of the stomach and duodenum generally show the early and late first stages of change. In the damaged mucosa lying between the epithelial cells I have observed a bacillus of constant morphological character in five of the six cases of acute pernicious beri-beri submitted here.

In connection with the gastro-duodenitis observed in this class of cases, it is of interest that a varying number of the primary set of mesenteric glands in the vicinity of the stomach and duodenum are generally found acutely swollen. Microscopically they exhibit active congestion and a moderate degree of cellular necrosis. No bacteria are present.

Next to the stomach and duodenum the heart is of most interest in acute pernicious beri-beri. The entire cardiac nervous system, inhibitory, accelerator and intrinsic, seems to be affected by the beri-beric virus in acute pernicious beri-beri.

In acute pernicious beri-beri the kidneys are usually found moderately congested.

The lungs show no changes that can be considered as characteristic even of acute pernicious beri-beri.

The spleen may be swollen, and the liver is generally found passively congested.

The muscles, if their nerves have been affected by the beri-beric virus, are flabby. No interstitial changes are noticeable.

If œdema has been a marked feature of the attack the nervi vasorum of the vessels in the œdematous areas exhibit the first stage of change. So also do the nerve-cells in the solar and other sympathetic plexuses.

Acute Beri-beri.

Clinical Summary.—The onset in this class of cases is similar in form, but differs in degree from the previous class. The premonitory syndrome of gastro-intestinal disturbance is perhaps not so marked. By the end of ten days a patient may be robbed of all voluntary movements of the limbs and trunk, the intercostals and diaphragm alone escaping. The diaphragm or intercostals may be slightly weakened. The various forms of sensation may be widely disturbed. Even the fifth and seventh cranials may be involved. On the other hand, the sensori-motor paralysis may not extend beyond the lower limbs. A combination of paralysis not infrequently seen is complete paralysis of the lower limbs, and partial paralysis of the fingers and forearms. Any degree of œdema may be present, and this quite independent of the sensori-motor and cardiac paresis. I do not think that the nervous system of the heart ever fully escapes in acute beri-beri; but the great violation of it seen in acute pernicious beri-beri does not occur. Cases of acute beri-beri seldom, if ever, die in the really acute stage of the disease.

Pathological Summary.—It is rare for cases of acute beri-beri to succumb in the acute stage of the disease, *i.e.*, while there are distinct evidences of gastro-duodenal inflammation, and during the development of the paralytic symptoms. It is generally some time after the gastro-duodenal syndrome has disappeared, and when the paralysis has developed, that the patients die.

Subacute Beri-beri.

In this class may be placed all those which Scheube terms rudimentary beri-beri. The premonitory syndrome of gastro-duodenitis is slight. The knee-jerk is lost in a few days. Numbness of the hands and even a slight paresis of the movements of extension of the wrist may develop; but as a rule the sensori-motor disturbance is restricted to the legs and feet. Various grades of œdema may develop in this class of cases, as in the others. It is never general, however. It is only rarely that signs of poisoning of the cardiac nervous system are demonstrable. The chief defect which appears is a tendency for the heart to beat more rapidly than it should on slight exertion. No irregularity develops, and there are no signs of tricuspid insufficiency. It is improbable that the nervous mechanism of the heart wholly escapes in any class of cases of beri-beri.

For the class of cases of acute and subacute beri-beri which do not recover on the elimination of the beri-beric virus, but remain in a more or less severe state of paralysis, I have proposed the name *beri-beric residual paralysis*.

Beri-beric residual paralysis may persist for almost any length of time, depending upon the extent of the original lesion in the cardiac nervous system, or the ability of those affected to withstand the effects of intercurrent maladies. I have notes of a case which had endured paralysis of extension of the ankles and loss of sensation in the legs for sixteen years.

The usual course is for such cases to succumb in from one to five years from heart failure, as the result of over-taxation of the diseased organ or from intercurrent affections, such as dysentery, Bright's disease, phthisis, pneumonia, or repeated attacks of malignant malaria.

During life the symptoms are those of any chronic neuritis, the amount of paralysis of a given movement or quality of sensation depending upon the extent of the initial poisoning of the neurones involved.

Pathological Summary.—It is of great importance to remember that the large majority of cases of beri-beri which come to the *post-mortem* table are cases of beri-beric residual paralysis or neuritis. These cases

have been searched by many to discover the active agent of the disease. The beri-beric residual paralytic is simply a nervous wreck, whose active cause has long since accomplished its work and departed. A gastro-duodenitis is never seen. Mesenteric glands are never found swollen; petechiæ are not to be observed in the serous membranes; granular degeneration of the kidney epithelium is rarely found; foci of small cells are not present in heart or kidneys. In fact, there are no positive signs of an acute process in any organ of the body.

Stages of Neuronal Change.

Early First Stage of Change.—The earliest stage of change that I have been able to detect in the neurones by Marchi's and Nissl's methods is, by the former, a slight black flecking of the myelin about the nodes or scattered discreetly along the internodes. If the case is one that has suddenly succumbed from the effect of the toxin on the whole mass of cardiac neurones, and before more than just a moderate general atonic paresis of the lower limbs is demonstrable, rounded droplets of altered myelin are not visible except in a few of the cardiac fibres of the vagi.

Where the changes in the selected fibres are not more advanced than as above, the parent cells are seen by Nissl's method to be slightly rarefied and to have swollen, moderately eccentric nuclei (axonal reaction). The Nissl's bodies of the processes have almost wholly disappeared, or they are extremely tenuous, and the small particles which compose them appear to be slightly dissociated. The Nissl's bodies of the periphery of the cell are also likewise involved. This part of the cell has the appearance of blued, thin ground glass. These changes are of course seen in the ventral motor cells of the cord, pons and bulb. The changes in the sensory cells of the posterior spinal ganglia and corresponding ganglia of the cranial nerves are practically the same.

Late First Stage of Change.—By this is meant a more advanced state of the above described changes. In the cells, the nuclei are all more or less swollen and dislocated (axonal reaction), the processes are denuded of Nissl's bodies and almost wholly of the fine deposit derived from them. The periphery of the cells is more rarefied, the central Nissl's bodies are more diaphanous, and from the decrease in their size they appear to be more discretely scattered.

Second Stage of Change.—This change marks, first, a longer action of the beri-beric virus, and, secondly, a reaction as the result of loss of function. The cells are more rarefied, or take on a massive blue colouration; the Nissl's bodies having either disappeared almost entirely or having broken down into a fine powdery but dense mass, which fills the whole cell except the original site of the nucleus. The latter is widely dislocated, even abutting on or being flattened against the cell wall. It also colours more deeply than normal, and is swollen. The terminations of the dependent fibres are in an early and distinct stage of atrophy—Wallerian in appearance.

Third Stage of Change.—By this is meant the vacuolation of the cell, rupture of its membrane and that of its nucleus; sometimes extrusion, either wholly or partially, of the nucleolus, irregular staining of the perikaryon and loss or fragmentation of the processes.

In acute pernicious beri-beri one never sees the second stage of change, but only the early and late first stages of change. In fatal acute beri-beri one sees similar changes. In beri-beric residual paralysis of short duration the second stage of change is chiefly seen. In cases of long duration the second or third stages, but chiefly the latter, are observable. The late first stage of change is also seen in beri-beric residual paralysis, where there is clinical evidence that almost wholly restored neurones have recently broken down as the result of some intercurrent disease or deleterious constitutional condition. The third stage of change in the neurones is sometimes accompanied by evidence of regeneration in a few fibres, and by more or less evidence of interstitial change in the nerve trunks, muscles, posterio-spinal ganglia, ventral horns and posterior columns of the cord.

Methods Used to Determine the Lesions of Beri-beri.

Nervous System.—The encephalon and spinal cord of each case were immersed for twelve hours in 5 per cent. formalin, then in 10 per cent. formalin for twenty-four hours. Pieces from the lower-limb areas and frontal convolutions were then passed into absolute alcohol, and ultimately stained by Nissl's method. The portion adjoining the Sylvian canal and the pons and medulla were likewise treated and stained by Nissl's stain. The spinal cord was carefully divided into its natural segments, and a slice of several cervical, of all thoracic, and of several lumbo-sacral metameres was passed into Müller's, and ultimately stained by Weigert-Pal, Marchi, and van Gieson methods. The remainder of each segment was passed into absolute alcohol and ultimately stained by Nissl's method. The cord and bulb were in most cases removed in their entirety by sawing through the occipital plate of the cranium. The posterior spinal ganglia were nearly all carefully removed, and after the preliminary fixation in formalin they were divided from the cord, and all of the right and every alternate left ganglion passed into absolute alcohol, to be subsequently stained by Nissl's method. The remainder of the left ganglia and the proximal and distal fibres of the great majority of all others were passed into Müller's, and afterwards stained by the Weigert-Pal or Marchi methods. The main nerves to the limbs were carefully dissected out from the plexuses to their terminations in the muscles and skin and, along with a piece of the latter structures, were pinned on sheets of cork and placed in Müller's fluid. Pieces from the proximal and distal portions of each third part were afterwards stained by the Weigert-Pal, Stroebe and Marchi methods. Great care was exercised in the removal of the vagal cardiac fibres. In the great majority of cases the nerves, with portions of the right heart attached, were dissected back to the deep and superficial plexuses and placed in Müller's fluid. When the material had hardened sufficiently the nerve-fibres were dissected to the heart muscle, and, with small portions of the latter still attached, were cut in proper lengths and treated by Marchi's fluid.

Parts of the right auricle and ventricle were preserved in absolute alcohol for the examination of Bidder's and Remak's cells. Marchi's method was used to detect fatty degeneration in the cardiac and other muscles. For general purposes the hæmatoxylin-eosin stain was used. Ganglia of the fifth and seventh pair of cranial nerves, the lower cervical and first and second thoracic sympathetic, the solar and other sympathetic ganglia, were fixed in absolute alcohol, and ultimately stained by Nissl's method. Where embedding was necessary both the paraffin and celloidin methods were employed. All fatal cases of beri-beri were autopsied soon after death, or kept in the refrigerator at a temperature between 23° and 40° F., until they could be autopsied.

EXPERIMENTS RELATIVE TO THE TOXICITY OF THE DISINFECTANT CYLLIN.

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The following experiments are extracted from a series commenced more than a year ago, with a view to determine whether or not the disinfectant cyllin is toxic when introduced in certain doses into the animal body (1) *via* the alimentary canal, (2) subcutaneously, (3) intraperitoneally, and (4) intravenously.

Cyllin (medical) was used for the feeding experiments, and for the other three forms of administration, cyllin specially prepared for intravenous injection.

Rodents and flesh-feeding animals were used.

Experiment 1.—A guinea-pig weighing 300 grammes was given 5 cc. of a 10 per cent. cyllin (medical) solution in distilled water, through a syringe introduced into the upper part of the œsophagus. For three days the animal was closely observed, and no indication of any disturbance was noted. At the end of this time the dose of 5 cc. was repeated, and the same dose administered at intervals of 4, 7, 7, 7, 2, 2, 3, 7 and 6 days, making in all 55 cc. in 48 days. Throughout this period the animal remained in normal health, as indicated by normal temperature, general appearance, and its feeding vigorously; it gained 5 grammes in weight during the time.

Experiment 2.—A rabbit weighing 900 grammes was given 5 cc. of a 10 per cent. cyllin (medical) by the mouth, three days later 5 cc., and the same dose at intervals of 4 and 7 days. Result—animal remained in good health, normal temperature, fed well, retained its weight.

Experiment 3.—A guinea-pig weighing 250 grammes was fed with a 20 per cent. cyllin (medical) solution, commencing with a dose of 5 cc., and continuing with doses of 3 cc. at intervals of 3, 4, 7, 7, 14, 2, 2, 3, 7, and 6 days, making 35 cc. of this solution in 45 days. The animal's condition remained normal throughout.

Experiment 4.—A guinea-pig weighing 320 grammes was given a 3-minim capsule of cyllin (intestinal) on March 6th; a similar capsule on the 7th; on the 9th a capsule morning and evening; on the 11th a capsule morning and evening; on the 13th and 14th the same dose morning and evening; and on the 16th a capsule in the morning. The animal remained throughout quite normal.

Considering results previously obtained in the disinfection of various intestinal bacteria, with small quantities of cyllin in dilutions of 1 per cent., 0·1 per cent., and 0·05 per cent., the quantities used in these experiments are larger than necessary for thorough disinfection of the alimentary tracts of the animals used. As, however, complete disinfection of the tract is not desirable, inasmuch as it never occurs in health, the intervals of time recorded in Experiments 1, 2, and 3 were allowed in order that the natural intestinal flora might reappear between the successive doses. In Experiment 4, where the intervals are shortened, the results are equally good. No remnants of capsules were found on careful examination of the fæcal matter voided, so that it is reasonable to assume that the contents were effectually liberated inside the bowel.

Experiment 5.—A cat weighing 1,250 grammes was given *per os*, on January 14th, 5 cc. 10 per cent. cyllin (medical), and a like dose on the 17th. A *post-mortem* examination, supplemented by careful microscopic examination of the epithelial tissues of the intestinal wall and kidneys, failed to detect any trace of inflammatory or other change.

Experiment 6.—A cat weighing 1,300 grammes had by the mouth, on January 17th, 5 cc. 20 per cent. cyllin (medical). At the end of seven days, when observations on this animal ceased, nothing abnormal had been noted.

Experiment 7.—A cat, 1,255 grammes, was given 3-minim capsules as follows: One on March 4th, one on the 5th, two on the 6th, two in the morning and two in the evening of the 7th, two in the morning and two in the evening of the 9th, two in the morning and two in the evening of the 10th, two in the morning of the 11th, two in morning and two evening of the 13th, two morning and two evening 14th, two morning and two evening 15th, seven capsules morning of 16th, and six capsules morning of 19th.

This animal remained normal throughout the period of the experiment.

Experiment 8.—A cat, 1,245 grammes, had capsules (3-minim) as follows: One morning, March 6th; one morning and one evening, 7th; one morning and one evening, 9th; one morning and one evening, 10th; one morning, 11th; one morning and one evening, 13th; one morning and one evening, 14th; one morning and one evening, 15th. The continuous administration of capsules in this case produced no abnormal results.

Experiment 9.—A guinea-pig weighing 300 grammes was given 3-minim capsules as follows: One morning, March 6th; one morning and one evening, 7th; one morning and one evening, 9th; one morning and one evening, 10th; one morning, 11th; one morning and one evening, 13th; one morning and one evening, 14th; and one morning and one evening, 15th. These continuous doses produced no abnormal change.

Experiment 10.—A guinea-pig, 250 grammes, was subcutaneously injected, on June 9th, with 2 cc. of a 1 per cent. solution of cyllin specially prepared for intravenous injection. This emulsion is so fine that the individual globules are much less in diameter than

human red blood corpuscles, and so stable that after standing for a month the amount of precipitate was inappreciable. There is no running together of the globules to form larger masses on standing for three months. Added to normal blood, to the extent of 1 per cent., no change in coagulation time was noticed. The same quantity added to serum did not produce coagulation in ten days. No change was noted in red or white blood cells when stained by Jenner's method. The animal was carefully observed for ten days, during which time no abnormal symptom was noted.

Experiment 11.—A guinea-pig weighing 260 grammes had an injection of 2 cc. of a 1 per cent. intravenous cyllin, made with normal saline, thrown into the femoral vein, on June 10th, under strictly aseptic conditions. Nothing abnormal was seen during ten days' careful observation.

Experiment 12.—On June 11th, a guinea-pig weighing 280 grammes had an injection of 4 cc. of a solution similar to the last, thrown into the femoral vein. This animal showed no abnormal symptoms during ten days' observation.

Experiment 13.—On June 20th a dog (medium-sized wire-haired terrier) had 10 cc. of a 10 per cent. intravenous cyllin injected into the femoral vein. During ten days' observation the animal remained in its usual health.

Experiment 14.—On December 14th, a cat weighing 1,300 grammes had 5 cc. of a 2·5 per cent. intravenous cyllin thrown into its femoral vein. During ten days' observation this animal remained quite well.

Experiment 15.—A cat weighing 1,350 grammes had 5 cc. of a 5 per cent. solution of intravenous cyllin injected into the femoral vein on December 15th, and presented no abnormal symptoms in the following ten days.

Experiment 16.—On January 19th, 1905, a cat weighing 1,400 grammes had 2 cc. undiluted intravenous cyllin thrown into its femoral vein. No abnormal symptoms were observed during the succeeding ten days' period of observation.

Experiment 17.—On February 2nd, a cat weighing 1,380 grammes had 2 cc. of the undiluted preparation injected into the femoral vein. This animal presented no abnormal symptoms during the succeeding ten days. The phrase "no abnormal symptom" indicates that the animal's temperature, appetite for food, appearance, and general behaviour remained undisturbed.

It would seem that the cyllin prepared for intravenous injection, when carefully filtered, and of the microscopic characters noted, may with safety be introduced intravenously, and otherwise as above described, into the animals mentioned, and without fear of any toxic symptoms. Its application also to the human subject would seem feasible.

I hope by further experiments to ascertain more intimately the action of this compound on normal blood, and on blood containing living bacteria, especially in relation to coagulation, hæmolysis, and bacteriolysis.

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THE

Journal of Tropical Medicine

JULY 1, 1905.

THE MEDICAL MISSIONARY CONFERENCE IN CHINA.

IT is satisfactory to record the success of the medical conference held in Shanghai during February, 1905. Some forty medical men and women assembled for the second of the conferences to be held from time to time under the auspices of the China Medical Missionary Association. Some valuable papers were contributed, but the chief subject of deliberation was that of the medical education of the Chinese.

As a preliminary to the introduction of Western medical teaching in China, it has been found necessary to translate standard works on the several branches of study into Chinese, and the members of the Association are to be congratulated on their strenuous endeavours in that direction. In the March number of the *China Medical Missionary Journal*, P. B. Cousland, M.B., C.M., contributes a paper on "Medical Nomenclature in China," and points out the difficulties to be contended with in preparing books on scientific subjects for a people to whom science and scientific nomenclature is unknown. We know the difficulty the Japanese had in this direction, nor have they yet overcome the disadvantage which their language places them at concerning the adoption of terms which are altogether foreign to their literature, for the Japanese still employ German as their medium

of scientific communication. We hoped for the sake of Chinese cultivation generally that English would have been the vehicle of medical education. With this idea, however, Dr. Cousland, and we presume the Association generally, declares that he has no sympathy, not that he disapproves of Anglo-Chinese medical schools, as in Shanghai and Hong Kong, but he believes a thoroughly good education in medical or in any other branch of science by means of their own language can be given to the Chinese. Dr. Cousland points out that to a Chinaman a Chinese character conveys more than is done by a Western student's vague recollection of the Latin or Greek derivation of a medical term.

Take the new names of the elements, the gases with the gas radical, the metals with the metal, and the earths with the earth radical, and the phonetic parts of the characters conveying either an appropriate meaning, as *light* for *hydrogen* or *yellow* for *chromium*, or *sun* for helium, and only in the case of the rarer elements being reduced nearly to the level of such delightfully simple names as the Western Didymium, Germanium, and Ytterbium. In anatomy the Chinese student is spared the effort of remembering what part is meant when Eustachius' tube or Stenson's duct or Glisson's capsule is quoted, or what disease or symptom—and I am sure I touch a responsive cord here—is to be understood when the revered names of Hodgkin, Addison, Graves, Friedreich, Paget, Rokitansky, Rosenbach, Well, Werlhoff, and others whose names I am afraid to undertake in public, not to mention thirty saints from St. Agatha.

Some argue that the direction being taken is perhaps not the right one, and contend that the result will be to give China a nomenclature of scientific terms wholly distinct from, and incomprehensible to, scientific men of any other country. This may be a disadvantage, and perhaps wholly unnecessary, for all Asiatics :—Turks, Armenians, Arabs, Hindoos, Bengalees, Parsees, Chinese in the Straits Settlements and Hong Kong, Annumese, Javanese and Japanese have, although in some instances their medical education is not far advanced, adopted a European scientific language, be it English, Dutch, German or French, as the medium of instruction. The Chinaman alone is to be trained upon different lines, and the possibility of the development of a " pidgeon " scientific language is not one to be welcomed, seeing that it would place China at a disadvantage in the field of scientific literature. However, the matter resolves itself into this. How can the Chinese acquire most readily scientific instruction in any science? If by translations of scientific works into their own language, even with a nomenclature to some extent different from accepted standards, then it is perhaps right and beneficial for the advance of China that it should be so. It is the immediate good of China and the Chinese one has to think of, and there can be no doubt that a book in their own language will not only allow them to acquire instruction more quickly, but will appeal to them in a way no foreign language ever can.

We notice also several papers were read at the conference upon opium and its abuses. We had hoped to see a definite resolution put and adopted by the conference. We have from time to time incurred in this Journal the displeasure of many right-minded men for the way we have spoken of those who attack the opium question in China. It is the way the attack is made, not the attack itself, which can be taken exception to. It is the wholesale abuse of a body of honourable men, the highest in the land, against whom no question of deceit, trickery or duplicity in other phases of governmental work is even whispered, that prevents the whole nation as one people joining in the anti-opium cry and condemning the importation of opium into China from India. We hope soon to hear that the Chinese Government, will, by an official and direct communication to the British Government, request that the importation from India to China shall cease. Since Japan attained her place amongst the first powers of the world, China holds a very different position now compared to a few years ago, and their requests will be listened to as they have never been before. When the request is made then is the time, for those who wish to see the end of the opium trade, to do their utmost to see that public opinion declares itself in the matter in decided terms. A resolution framed by the members of the Conference and forwarded to the Chinese Government might have helped to bring about that desirable end.

COLONIAL CIVIL SERVICE.

Mr. W. Rees Davies, King's Advocate of Cyprus, has arrived in England on leave, during which Mr. Stanley Fisher, President of the District Court of Kyrenia, will act as King's Advocate.

Mr. A. N. Galbraith has been selected for the office of Assistant to the Government Agent of the Eastern Province of Ceylon and additional Police Magistrate of Batticaloa.

Dr. C. Simson has taken over the duties of Acting Medical Officer at Port Moresby, British New Guinea.

Mr. John Maxwell, District Commissioner of the Gold Coast Colony, takes the place of Mr. T. E. Fell, who has been promoted, as a Travelling Commissioner of the Native Affairs Department of the Gold Coast.

Mr. C. Spencer, Inspector in charge of the Papho Police, Cyprus, acts as Commissioner of the Papho District during the absence on leave of Mr. C. W. Wodehouse.

Mr. J. H. Kleinschmidt has been appointed Chief Inspector of Schools in Natal.

Mr. J. H. Leak succeeds Mr. B. J. Dutton as Police Magistrate of Jaffna, Ceylon. Mr. Dutton has been transferred to Anuradhapura in a similar capacity.

Mr. Walter Egerton, C.M.G., Governor of Lagos and High Commissioner of Southern Nigeria, will arrive in England next month on leave of absence.

Dr. J. E. Duerden, formerly Curator of the Institute of Jamaica, has been appointed Professor of Zoology at the Rhodes University College, Grahamstown, Cape Colony.

Mr. Cecil Clementi, Assistant Registrar General, Hong Kong, becomes Assistant Land Officer for the New Territories, and exercises the jurisdiction of a Police Magistrate within the Territories.

A VISIT TO THE PASTEUR INSTITUTE IN PARIS.

By Harold Hamel Smith,
Editor of "Tropical Life."

Since the present buildings of the Pasteur Institute arose in the Rue Vaugirard in Paris, it has been my ambition to visit that most fascinating of institutions. Chance at last enabled me to satisfy my wish, and, what is more, I had the good fortune to have Drs. Roux and Laveran to explain the principle of their methods of working and to act as cicerones.

Of course, not being a medical man I can give no scientific idea of the advantages such an institution bestows on mankind, though as I listened to the explanations I could fully realise them myself. After I had been received by and introduced to Dr. Roux, Professor Laveran explained the maladies caused by tropical insects (which concerned me the most), such as mosquitoes, &c., and pointed out to me the fine miscroscopes and slides they had round the lecture-room. That finished, I was conducted by Dr. Roux to what seemed to me a very touching part of the Institute, that is, the great marble tomb of Pasteur in the underground chapel, where it rests with the precious remains committed to its charge in the centre of the spot where the living man laboured so marvellously. Then we passed again through the beautiful hand-beaten iron gates that shut in the chapel, and visited laboratories, private experimenting rooms and wards, inspecting the machinery and larger apparatus, which is very interesting, as we passed up and down the staircases of the two buildings composing the Institute that face each other across the road.

Besides those actually engaged in the Institute itself, it seems that anyone making experiments, or trying to discover or isolate a new serum or bacillus, not only can have the room and apparatus of the Institute to make use of, but can even have private rooms of their own under lock and key to work in until they attain their end, and can make known to the world the new discovery they have made.

Whether the isolation wards that I next visited fulfil all that is claimed or expected of them, I am not capable of saying, but I can say I found them most beautifully kept in every way. They have a specially made porcelain lining to about four feet high, and from that to the lofty ceiling it is glass on all sides, set in iron casements and iron-frame doors, so that they look like greenhouses, and unless the patients are reclining on their beds they can see into each other's rooms, out of doors, or into the passage.

One of the great points in these wards is that they are absolutely infection-proof, so beautifully are the doors and other fittings made to make sure of the isolation being reliable. Each room is provided with all the necessary conveniences the patient needs, including a sink and taps, and all nooks and corners are rounded, as well as the bottoms of the walls where they run into the floor, so that it is impossible for any dust, or, worse still, any microbes to remain. All kinds of infectious diseases arising from germs are thus able to be detained and placed under observation and treatment until the patient is cured, without any fear of one patient's infection being communicated to another. Each ward, too, has a door leading down to its little garden where the patient can, when well enough, take a constitutional.

New wards are being built to cope with the demand for more accommodation, and so we could enter and examine the beautiful glazed surface of the large slabs that run along the lower part of the wall to about four feet high to give the privacy between the wards, and also noticed how highly everything fitted and yet worked beautifully. Then we came to the entrance from the outer world, by which cases come in and are at once isolated in separate little rooms until the doctor can examine them, and either pass them on into the Institute or out again into the street. Here, too, I bid good-bye to Dr. Roux, and concluded what had been to me a most fascinating afternoon's visit.

Reviews.

Snake Poisons. Vital, Brazil. Maloine, Paris.

The Director of the Pasteur Institute of Sao Paulo describes the poisonous snake of South America, and the effects on man and animals, showing how in some cases the nervous system is more particularly affected. The venins differ from those of Indian snakes, an important fact to bear in mind when using serum treatment for snake-bite. This most important work on the poisonous snakes of the New World concludes with directions as to the modes of collecting snake poi on and the preparation of serums.

A Monograph of the Anopheles Mosquitoes of India. By S. P. James, M.B., I.M.S., and W. Glen Liston, M.D., I.M.S. Thacker, Spink and Co., Calcutta, and W. Thacker and Co., 2, Creed Lane, London, E.C. 1904. 132 pp. Illustrated. Price 24s. net.

This book is so clearly written, so excellently illustrated, and so well printed, that we have no criticism except of a favourable nature to offer. The authors' names are sufficient to commend the book to every one interested in the subject of malaria-bearing Anopheles, their anatomy, classification, and their habits. Part I. consists of four chapters. Chapter I. is devoted to "a general account of mosquitoes," and is admirably written. Chapter II. deals with the collection, mounting, examination, and identification of Anopheles mosquitoes and their larvæ. In Chapters III. and IV. are described the habits and classification of Anopheles respectively. Part II. contains "Systematic descriptions of the Anopheles mosquitoes found in India."

In the preface the authors draw attention to the fact that they have not followed Mr. Theobald's new classification of Anopheles, but we are glad to note that they have added under the title of each mosquito described the genuine and specific names by which insects are known to him.

The illustrations in the text are exquisite, and the

diagrams and drawings by D. A. Turkhud, M.B., of Bombay, are at once teaching and artistic. This book will no doubt be found in every library, public and private.

Notes and News.

The American Microscopical Society meets at Cedar Point, near Sandusky, Ohio, on July 5th, 6th, and 7th. An especial feature of the meeting will be the papers and discussions on medical zoology. The President, Dr. Henry B. Ward, will open the scientific sessions by an address upon the "Relation of Animals to Disease." One day will be devoted to a symposium with demonstrations on animal parasites and their effects on their hosts.

[We regret that this notice arrived too late for insertion in our last issue.—Ed. *J. T. M.*]

Sir Alfred Jones, K.C.M.G., has increased his subscription to the Colonial Nursing Association from £50 to £250. It is to be hoped the example set by Sir Alfred will be followed by others, in order that this excellent Association may not be hampered in its work by want of funds.

Latent Plague.—The statement made by Sir Henry Blake, Governor of Hong Kong, that some thousands of Chinese in Hong Kong, between June 23rd and July 10th, 1903, had plague bacilli in their blood although all clinical symptoms were absent has been refuted by subsequent observations. The investigations conducted in Manila by Herzog and Hare serve also to show that the existence of latent plague in human beings does not occur.

In Rangoon during March 50,000 rats were killed as a plague prophylactic.

A simple method of preventing ankylostomal infection by way of the soil is described by Sir Patrick Manson: A West Indian sugar-planter encouraged his coolies to dip their feet and legs in green Barbadoes tar and then tread on fine sand. An impervious covering to the skin of the lower extremities was thus obtained.

Plague.

Prevalence of the Disease.

India.—During the weeks ending May 13th, 20th, 27th, and June 3rd, the deaths from plague numbered 42,003, 35,492, 23,038, and 15,317.

South Africa.—During the weeks ending May 13th, 20th, 27th, and June 3rd, the reports were: *East London:* Fresh cases, 8, 0, 3, and 1; deaths, 1, 1, 1 and 1. *King William's Town:* Fresh cases, 0, 3, 1 and 0; deaths, 0. *Queenstown:* Fresh cases, 1, 0, 3 and 0; deaths, 1, 0, 1 and 1.

Mauritius.—No cases from March 16th to first week in June. Weeks ending June 8, 15th, and 24th, fresh cases, 1, 4 and 3; deaths, 0, 3 and 2.

Hong Kong.—During the weeks ending May 27th, June 3rd, 10th and 17th, fresh cases, 20, 21, 21 and 25; deaths, 19, 19, 21 and 26.

Queensland: Ipswich.—During week ending June 13th, fresh cases, 7; deaths, 1; last reported case May 8th.

Egypt: Tukh District.—During weeks ending April 22nd and 29th, fresh cases, 0 and 2; deaths, 1 and 0.

Formosa.—Between April 20th and 30th, fresh cases, 238; deaths, 210.

England: Manchester.—A death from plague occurred in Manchester on June 13th. The patient had arrived on board ship at Middlesborough, *via* Hamburg, from Buenos Ayres, and on reaching his home in Manchester on June 10th, developed plague and died in a couple of days.

Scotland: Leith.—On May 5th a case of plague occurred at Leith; on May 8th and 10th, 1 and 2 additional cases were reported. The cases were all from one house, and consisted of the father, mother, and two of their children. Source of infection uncertain.

Geographical Distribution of Disease.

As information arrives we publish, under this heading, the principal diseases met with in tropical and sub-tropical countries, so that those interested in the Geographical Distribution of disease may have a means of gathering information concerning the prevalent ailments in different parts of the world.

Tuberculosis Amongst Negroes.

In New York negroes suffer extensively from tuberculosis. The alleged cause is overcrowding and insanitary dwellings. Steps are being taken to deal with the matter.

Cerebro-spinal Meningitis in Germany.

During April 1,200 cases of cerebro-spinal meningitis occurred in Upper Silesia; about half the number died. In Berlin three cases of the disease were reported on April 5.

Yellow Fever.

Panama.—Between January 1st and April 29th, 1905, the cases of yellow fever amounted to 50, and the deaths from the disease numbered 20. The disease broke out in virulent form in the Government buildings, which are old and insanitary, the victims being clerks in official employ. Gorgas, the Governor, reported on May 12th that no new cases had occurred for nine days, but between that and May 18th six additional cases of yellow fever were reported.

Uncinariasis in Porto Rico.

Medical Record, May 20, 1905. (Leader.)—The Report of the Commission, consisting of Drs. B. K. Ashford, W. W. King, and P. G. Igaravillez, for the Study and Treatment of Anæmia in Porto Rico, published by the U.S.A. Government, states that: (1) The anæmia is due to the presence of the *Uncinaria*

Americana in the human intestine; (2) the parasite *U. Americana* differs from the *U. duodenalis* (*a*) in the nature of the buccal armature of the parasite, and (*b*) in the size of the ova. Of 5,500 cases of anæmia examined, 5,490 were due to uncinariasis; and of this number thirteen died. As pollution of the soil is recognised as the chief medium of infection, and as the larvæ may enter by the mouth or by the skin, the prophylaxis required is devoted to (*a*) general cleanliness and careful washing of the hands before eating; (*b*) the provision of suitable latrines to prevent the fæces polluting the soil broadcast; (*c*) wearing shoes to prevent the larvæ gaining access by way of the skin of the feet.

Nutmeg Poisoning.

Laurie, H. (*Australian Medical Gazette*, April 20th, 1905), records a case of poisoning due to a woman having grated four nutmegs into a cup of hot water, and drinking the whole quantity before going to bed. Some five hours afterwards Laurie found the patient almost unconscious; skin moist and cold, pupils dilated, pulse 156, feeble with occasional irregularity, respirations shallow and occasional sighing. Strychnine gr. $\frac{1}{40}$ was given hypodermically, a mustard leaf applied over the heart, warmth applied to the body, and as soon as possible a large dose of castor oil was administered. The patient made a good recovery. The woman had taken the nutmeg as her periods had not appeared; she was found to be pregnant, but the nutmeg proved useless as an abortifacient. The official dose of nutmeg is 5 to 15 grains, so that the woman had taken at least twenty times the officinal dose.

Can practitioners in the Tropics give any account of nutmeg as a drug in the treatment of disease, or of its use as a means of procuring abortion amongst natives of the Tropics?

New Drugs.

Petrobrose.—This combination of barley proteids with a hydrocarbon oil contains the diastatic ferment of malt, phosphates, hypo-phosphites, albumen and albumenoids. We have taken pains to ascertain the genuine quality of Petrobrose, and can vouch for its purity and for the care and attention paid to its preparation.

Petrobrose is free from the smell so frequently associated with petroleum compounds, and is most agreeable to the taste.

For chronic intestinal ailments, more particularly chronic dysentery and sprue, Petrobrose lays claim to be of especial use. We have tried Petrobrose for both chronic dysentery and sprue, and find that it is well tolerated by patients suffering from these diseases, serving to allay intestinal irritation, soothe the bowel, and create a healthy tone to the digestive system.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the Journal of Tropical Medicine *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Revista Medica de S. Paulo," March 31, 1905.

Comment on meurt de la fiévre jaune. (Modes of Death in Yellow Fever). By Dr. C. Mauro.

Dr. Mauro states that we have almost complete studies on the mechanism of death in several diseases, but, so far as he is aware, none with reference to yellow fever; for this reason he describes with much detail a series of eighteen typical cases of this disease, which he selects from amongst the many of which he took full notes during the epidemic which raged at Ribeirãs Preto in 1903.

The description usually given of yellow fever, with its three periods, with its numerous clinical forms, amongst which many authors have wandered and strayed, show how far we are still from an accurate knowledge of this scourge.

The description of its clinical forms—when this is not based on a pathogenic interpretation, but represents rather a more or less extensive method of cataloguing—is thoroughly useless, not to say impossible, for no other acute disease exists of which it may be said as of yellow fever, that each case is a new revelation of the disease, or that each patient has a nosological personality so peculiarly his own.

Neither does the description of the so-called classical form answer in the great majority of cases, nor can it bear even the most superficial criticism. In the present state of our knowledge, we must regard yellow fever as a general infection with special local affection of the hepatic glandular structures, which presents itself clinically as an acute pyrexia with a cycle of three to four days. This is how it can be seen in its pure form. But three factors may affect this appearance, viz., the soil on which the yellow fever infection is grafted, the severity of the hepatic lesions, and the superadded infections and intoxications.

In yellow fever there is a vulnerability more or less accentuated, not only according to race, age, &c., but also appreciable differences may be seen in different individuals. Neither can it be denied that it has an elective affinity for the hepatic gland, but a discussion on this point would here be out of place. In each case it is noticeable that alcoholism markedly aggravates the infection, that preceding morbid conditions of the kidneys favour renal complications, that over-indulgence, neuroses, &c., favour the determination of nervous symptoms, &c.

Yellow fever, being a toxi-infection with special local action on the liver, the inability of this organ to fulfil its functions is a constant feature of the disease; in fact, all things being equal, it may be stated that it is the extent of the hepatic lesions which influences the progress and the phenomena observed in yellow fever. When the lesion is not severe and the restoration to a normal state can be rapidly restored, the

pure form of yellow fever exists (an acute pyrexia which completes its cycle in three to four days, or the so-called *abortive* form). When the hepatic cells have been more severely affected, the greater form of hepatic insufficiency is established, but merely as an epiphenomenon of yellow fever. But if the liver is very seriously attacked the symptoms of hepatic obstruction are superadded to those of the yellow fever, and the fulminating form is to be seen. The list of symptoms of yellow fever may also be modified or complicated in addition by other infections and intoxications, and indeed, these are rarely wanting, as may be proved by an examination of the blood.

* * * *

Dr. Mauro states that death occurs in yellow fever in one of the following methods: By the severity of the intoxication, the effect being severe and irremediable as regards all the elements of the organism; by the insufficiency of an organ or of a system which has become vulnerable by a peculiar state of morbid receptivity; by a complication nearly always allied to a superadded infection.

A. Superacute toxæmia.
B. Incompetence of the nervous system.
C. Cardiac incompetence { *a* Progressive exhaustion. *b* Acute syncope.
D. Renal incompetence.
E. Hepatic incompetence { *a* Hæmorrhagic form. *b* Nervous form.
F. Complications ... { *a* Intestinal infection. *b* Parotitis. *c* Meningitis (in children). *d* Septic accidents. *e* Acute atrophy of the liver.

A series of eighteen typical cases are then quoted at some considerable length in order to illustrate the various forms of death shown under these various headings.

J. E. N.

"L'Echo Medical du Nord," April 2, 1905.

Ankylostomiasis. A. Calmette and M. Breton.

In Westphalia the miners are admitted to hospital on Monday, in the evening being given 0·25 grams (4 grains) of jalap and the same amount of calomel. On Tuesday morning they get 8 grams (2 drams) ethereal extract of male fern and 20 grams (5 drams) syrup of senna; and a light meal. On Wednesday evening and again on Friday evening the treatment is repeated; the patients being discharged on Saturday evening, and have a four days' rest on full wages.

The worms are completely expelled in 80 per cent. of cases. The dejecta are examined daily for three days; if no eggs are found a certificate is given, but if they are found the miners are only allowed to work above ground, and have to return for treatment in a fortnight or three weeks.

While in hospital the miners receive full wages; half of it is paid by their union, mine-owners paying the other half. All hospital expenses, including medical expenses, are paid by the union.

In Belgium the treatment is less severe, but hardly as efficacious. The first day a purgative dose of castor oil or compound tincture of jalap is given. Next day 4 grams (1 dram) of extract of male fern and 2 grams (½ dram) of chloroform is administered in divided doses at an interval of half an hour. Two hours after 200 grams (6¼ ounces) of chloroform water are taken. This is again followed in two hours by compound tincture of jalap 20 grams (5 drams), with an equal quantity of syrupus rhamni. The treatment is recommenced on the fourth day, the patient leaving hospital on the evening of the sixth day.

Successful treatment depends on the freshness of the ethereal extract of male fern. In large doses—15-20 grams (4-5 drams)—it may cause disturbance of sight, faintness, headache and temporary albuminuria; this is avoided by giving the drug in divided doses, combined with a purgative such as castor oil. Out of 19,000 miners treated in Germany the sight was only affected three times, twice being in cases of marked anæmia.

Thymol (syr acid. thymic.) is chiefly relied upon in Italy, England, and America. It is given in 4 to 8 gram (1-2 drams) doses in cachets or capsules; sometimes even 15 grams (3¾ drams) are given. The treatment consists of rigorous milk diet for a day, with in the evening a purgative of 0·50 gram (8 grains) of calomel, combined with 0·25 gram (4 grains) of jalap, or 2 grams (½ dram) of powdered senna. Next morning 2 grams (½ dram) of thymol is given every two hours, three or four times; each dose being followed by a cupful of warm mucilaginous drink, as barley water or rice water. At mid-day, clear soup, milk, or coffee is given. It is necessary to avoid oil as a purgative or in any other way, chloroform water, glycerine or ether, and above all things, any form of alcohol. Toxic effects are lowering of the temperature, slowing of the pulse and respiration, collapse and delirum. The patient has a burning sensation in the pit of the stomach, which is relieved by sipping cold or iced water.

T. P. B.

"Archiv. f. Derm. u. Syph.," September, 1903.

Pathology of Madura Foot. M. Oppenheim.

Histologically the black and yellow varieties of the disease, as shown by specimens obtained from Bombay, are indistinguishable. Both are granulomata made up of round cells, epithelioid cells, plasma cells, and giant cells. Both tend to abscess formation and necrosis, though the black variety is more apt to form abscesses and to liquefy than the yellow, which has a greater tendency to form new connective tissue. Hyaline degeneration is absent in the black variety, but present in the yellow. Great difference exists in the fungus present; for in the black variety it is of the nature of an oidium, while in the yellow it is closely allied to the actinomyces.

T. P. B.

"Gazette des Hoptiaua," p. 1447, 1904.

ELEPHANTIASIS.

The theories prevalent regarding elephantiasis may be arranged into:—

(1) The parasitic theory. A parasite is present in the blood or lymphatics.

(2) The mechanical theory. A stasis in the blood-vessels or lymphatics.

(3) The infectious theory.

In regard to the *parasitic* theory the writer in the Gazette is of opinion that it has not been scientifically demonstrated that the elephantiasis of warm countries is due to filariasis. The *mechanical* theory of prolonged blood stasis will not account for interstitial thickening of the tissues unless accompanied by an inflammation. The *infectious* theory is supported by Achaline, who considers the conditions to be due to the streptococcus of erysipelas; but these cannot be considered to be the prime cause of elephantiasis. The only factor common to all forms of elephantiasis is inflammation, whether arising from a phlebitis, exogenous infection, or from endogenous thickening, caused by swarms of round cells grouped around the capillary vessels.

The writer in the Gazette holds that all we know of the pathology of elephantiasis resolves itself into a condition of the parts due to interstitial hyperplasia of the skin, brought about by an inflammatory œdema, the active etiological factor being unknown.

"Presse Médicale," Paris, November 19, 1905.

L'Habitation Coloniale. By J. D'Anfreville.

The authorities in Senegal have directed that before the plans of a new dwelling house are passed a medical expert on hygiene must be consulted. D'Anfreville is of opinion that certain well-considered plans should be followed when a house is about to be built in a tropical country. (1) The dwelling house should be apart from the kitchen and outhouses. (2) The house should be of a single storey, rectangular in shape, and the partitions between the rooms should run parallel to each other from front to back of the house. (3) The doors opening on the verandah surrounding the house should be opposite each other in each room, and, in addition, there ought to be a door at each end of the house and opposite the doors in the partitions, so that air can sweep right through the house from front to back and from end to end.

American Medicine, June 3, 1905.

Malarial Infection Presenting Symptoms of Multiple Neuritis. By G. E. Price, M.D.

Price relates the case of a young girl who, after malarial infection, showed symptoms of multiple neuritis for eighteen months. The patient suffered pain, abnormal sensations, diminished muscular power with hand tremors, foot-drop, intermittent fever, and the æstivo-autumnal parasite in the blood. Quinine effected a cure.

Zeitschrift für Klinische Medizin, Berlin, Vol. lvi., Nos. 5, 6.

Zur Kenntniss der Sporadischen Einheimischen Dysenterie. By A. Albu.

Albu describes a case of acute dysentery in a woman who had returned to Berlin after a visit to Silesia and Breslau. *Post mortem*, the intestines presented the characteristic appearances of tropical dysentery. The *Amœba dysenteriæ* (Schaudin's histolytic amœba) was cultivated from the stools.

Spolia Zeylanica, vol. ii., Part viii., March, 1905.

1. *Cysticercus cellulosæ* in a Tamil. By A. J. Chalmers, M.D., F.R.C.S.

2. Anophelinæ found in Ceylon. By A. J. Chalmers.

(1) Chalmers describes a case of *Cysticercus cellulosæ* in a Tamil woman, and remarks that so far as can be ascertained the parasite has never been met with before in Ceylon. The patient, aged 40, died of obscure symptoms, and at the *post mortem* well-developed cysticerci were found in both pictoralis major and in the brain, in the grey matter of the cortex, in the choroid plexus, in the third ventricle, in the brachium conjunctivium, and in the pons.

The tape-worms known to affect man in Ceylon are *Tænia solium* and *Tænia saginata*. No tape-worms were found in the intestine of the Tamil woman examined by Dr. Chalmers.

(2) LIST OF SPECIES FOUND IN CEYLON.

I have recognised the following species of the *Anophelinæ* in Ceylon, and Mr. Green, of Peradeniya, has found one species, *Nyssorhynchus maculatus*, which I have not found, but which is included to make the list complete. The names are those given in Theobald's Monograph on the Culicidæ of the World, vol. iii.

(1) Genus *Myzomyia* (Blanchard): Species 1: *Myzomyia Rossii* (Giles). Species 2: *Myzomyia culicifacies* (Giles). Species 3: *Myzomyia Listoni* (Liston).

(2) Genus *Myzorhynchus* (Blanchard): Species 4: *Myzorhynchus barbirostris* (Van der Wulp).

(3) Genus *Nyssorhynchus* (Blanchard): Species 5: *Nyssorhynchus maculipalpis* (Giles). Species 6: *Nyssorhynchus fuliginosus* (Giles). Species 7: *Nyssorhynchus Theobaldi* (Giles). Species 8: *Nyssorhynchus maculatus*, found by Mr. E. E. Green.

(4) Genus *Pyretophorus* (Blanchard): Species 9: *Phritophorus jeyporensis* (Theobald).

(5) Genus *Cellia* (Theobald): Species 10: *Cellia argyrotarsis* (Robineau-Desveidy).

The most common are the *Myzomyia Rossii*, *Myzomyia culicifacies*, *Myzorhynchus barbirostris*. The *Anophelinæ* found in Ceylon are the same species as those found by Stevens, Christophers, James, and others in India, and are different from those of Africa and America.

A doubtful species is noted, *Nyssorhynchus Jamesii*, by Dr. Philip, from Mutwal, Colombo, named from a damaged specimen.

"The China Medical Missionary Journal," October, 1904.

1. Inherited Syphilis in Hankow.

2. *Ankylostomum Duodenale* at Chang-Teh, Hunan.

3. Leprosy in Hangchow, Fokien.

(1) S. R. Hodge remarks that in hospital practice inherited syphilis occurs in about the same propor-

tion as in Britain. In China the conditions of life favour the operation of the law of the survival of the fittest which works unhindered.

Severe cases of epiphysitis with subsequent pyæmia and brain trouble, succumb early, and the children are not seen at hospital; many, too, fall victims later on to general marasmus. Enlargement of the spleen is frequent in the hereditary syphilis of childhood, and may cause a considerable abdominal tumour. The liver, too, is frequently enlarged, so that the clinical signs and symptoms of chronic malaria are present, and may lead to confusion.

(2) O. T. Logan, writing from the central Chinese province of Hunan, mentions the fact that patients with ankylostoma eggs in their fæces are not an uncommon occurrence in that district. Dr. Logan recommends Jenner's solution as a means of staining the ova of the ankylostomum.

(3) In the large city of Hangchow a leper settlement has recently been provided outside the city which affords work for the lepers, such as fishing and gardening, and the general comfort of the lepers has been greatly improved thereby. In regard to the cause of leprosy it is noted that in this district salt is dear and most of the fish is sun-cured, and as the climate is hot and putrefaction speedy, all the conditions favouring Mr. Hutchinson's theory are present. Contagion is unknown; attendants do not contract leprosy, husband and wife seldom suffer at the same time, and two cases in one family are quite exceptional.

"Presse Médicale," January 14, 1905.

TREATMENT OF TROPICAL ULCERS.

Fontoynonta Jourdan, in Madagascar, irrigates the ulcers with a 5 per cent. watery solution of eosin, and exposes them to the action of the sun during the day, using an ordinary dressing at night.

In Europeans the parts adjacent to the sore must be protected by an opaque dressing.

Almost as good results have been attained by exposing the sore to the sun's action without using eosin.

T. P. B.

"Le Caducée," March 18, 1905.

PREVENTION AND CURE OF BERI-BERI.

Dr. J. Hulshoff Pal has investigated the action of the fruit of *Phaseolus radiatus*, called by the Malays *katjany-ido*, and finds that it is beneficial in cases of recent beri-beri, but not when there is degeneration of the peripheral nerves; it causes albuminuria and œdema to disappear. It begins to act on the fifth day, and is a certain prophylactic, but its administration must be continued in doses of 150 grammes. Water does not absorb the active principle.

T. P. B.

"Lancet-Clinic," Cincinnati, Ohio, May 20, 1905.

Treatment of Spotted Fever. By P. M. Ashburn.

Ashburn recommends for spotted fever the Brand treatment of typhoid, with, in addition, the occasional use of normal salt infusions and such drugs as calomel, alcohol and strychnine. Immersed in a bath of 73° F., friction is applied to the body and limbs, with cold applications to the head, repeating the treatment every three hours for from ten to twenty minutes at a time so long as the temperature remains above the normal.

Yellow Fever.

British Honduras: Belize.—May 25th to June 4th, fresh cases, 4; deaths, 4.

Honduras: Puerto Cortez.—May 25th to 29th, fresh cases, 5; deaths, 3.

Mexico: Tierra Blanca.—May 14th to 20th, fresh cases, 0; deaths, 1.

Panama.—January 1st to May 13th, fresh cases, 63; deaths, 22.

EXCHANGES.

Annali di Medicina Navale. Annali d' Igiene Sperimentale Archiv für Schiffs u. Tropen Hygiene. Archives de Medicine Navale. Archives Russes de Pathologie, de Médec. Clinique et de Bacteriologie. Australasian Medical Gazette. Boletin de Medicina Naval. Boston Medical and Surgical Journal. Bristol Medico-Chirurgical Journal. British and Colonial Druggist. British Journal of Dermatology. British Medical Journal. Brooklyn Medical Journal. Caducée. Climate, Clinical Journal. Clinical Review. Giornale Medico del R. Esercito. Hong Kong Telegraph. Il Policlinico. Indian Medical Gazette. Indian Medical Record. Indian Public Health. Interstate Medical Journal. Jahresbericht. Janus. Journal of the Royal Army Medical Corps. Journal of Balneology and Climatology. Journal of Laryngology and Otology. Journal of the American Medical Association. La Grèce Médicale. Lancet. Liverpool Medico-Chirurgical Journal. Medical Brief. Medical Missionary Journal. Medical Record. Medical Review. Merck's Archives. New York Medical Journal. New York Post-Graduate. Pacific Medical Journal. Polyclinic. Public Health. Revista de Medicina Tropical. Revista Medica de S. Paulo. Sei-i-Kwai Medical Journal. The Hospital. The Northumberland and Durham Medical Journal. Transactions of the American Microscopical Society. Treatment. West India Committee Circular. West Africa.

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Original Communications.

ON A POSSIBLE MODE OF COMMUNICATION OF LEPROSY.[1]

By T. C. Mugliston, M.D.

Colonial Surgeon, Penang.

I bring forward these few ideas with considerable diffidence, and solely with the hope that the attention of others dealing with large masses of lepers may have their attention directed towards what, I suggest, is a plausible cause of the propagation of leprosy; and that in dealing with the variety of causes, strenuously urged by eminent authorities, my imperfect ideas may be given a small place in their researches.

In investigating the origin of a disease, I think it is logical to search for the primal cause of the disease, and if such be discernible to follow its action.

In leprosy we have in all types but one kind of bacillus and we may accept this as the primal cause of the disease, similarly to the way we accept the tubercle bacillus (from which it is difficult to differentiate it) as the primal cause of tubercle of the lungs, &c.

This being accepted, we have to enquire how this primal cause is introduced into the tissues.

We all know that the microbes of different diseases have different degrees of readiness of introduction. Thus, for example, the anthrax bacillus is welcomed with avidity by any absorbing surface, whereas that of tubercle is more difficult of transference. Whether this is due to increased vigour of the bacillus itself, or to less resistance through some hereditary predisposition of the part attacked or not, there are various opinions,

I have always looked on leprosy as one of the more difficult diseases to communicate.

We see healthy attendants living in close communion with lepers for years without contracting the disease, in a way that would not be possible say in the case of patients suffering from tubercle of the lungs.

I have known a dresser contract the disease in a leper hospital, but this is rare, and what I am coming to may explain it.

If we accept this difficulty of communication as a fact, we have to look further for the cause than the casual touching of an absorbing sore on an attendant's hand by the discharges from a leprous sore. We must look for some instance where the leprous bacillus is kept in apposition with an absorbing surface for a much longer period than the above, and where it will be under more favourable conditions for growth than on the hands of an attendant or dresser who understands the importance of cleanliness.

I have for many years, both when in charge of the male and female leper hospitals in Singapore, and for the last few years since I have had charge of the Pulau Jerajak Leper Asylum in Penang, where we have over 300 lepers, been looking for some way in which the leper bacillus could have a favourable chance of transference and growth.

[1] Read before the Penang Division of the British Medical Association, June 2nd, 1905.

Itch Insect the Possible Carrier of Leprosy.

I have for many years noted the almost universal occurrence of itch in lepers, but I fear that, until a few years ago, I only looked on this as one of the dirt conditions which might be expected in those who have little to look forward to in life, and so get careless of their surroundings. In connection with this I have found that of 400 patients in the Pauper Hospital, twenty-five have itch.

Later, as I began to recognise from various facts the communicability of the disease, it occurred to me that here we had an almost ideal method of—shall we say—inoculation, and I began to make enquiries on these lines.

I find that of seventy-seven lepers admitted from January 1st to May 31st, 1905, forty-four had itch on admission, eleven more remembered having itch, and twenty-two could not remember.

When we take the life-history of the *Acarus scabei*, we see that the way it burrows under the cuticle, and remains in a position for a considerable time where the conditions are most favourable for the growth of the leprous bacilli with which it is covered, coming as it does from the part of the leper where the leprous bacilli are most numerous and vigorous, it is, I think, fair to assume that this is a possible way of communicating the disease.

I do not propose on this occasion going any further into the large question of leprosy or to refer in any way to the various theories advanced by different observers, but as we have Roman Catholics at Pulau Jerajak, I think it right to mention that forty-one of the forty-seven were converted on the island; of the four remaining, two are Eurasians, who probably contracted the disease from the sister of one of them who is in the female leper ward on Penang Island; the other two, one a Chinaman, one a Tamil, are the sons of Christian parents. With reference to occurrence of leprosy amongst Roman Catholics generally, it may be found that similar conditions exist elsewhere.

I am very sorry to have to present this paper in so imperfect a state, but I wish to draw attention to this idea of communication of leprosy. It may be possible to decide whether it is a special form of animal that conveys the disease or simply the ordinary itch insect, which, again, may have the leprous bacillus *in* or simply *on* its tissues.

THE SUCCESSFUL APPLICATION OF PREVENTIVE MEASURES AGAINST BERI-BERI.

By Hamilton Wright, M.D., C.M.(McGill).

Late Director of the Institute for Medical Research, Federated Malay States.

Abstract IV.

(From the *Journal of Hygiene*, vol. v., No. 2, April, 1905.)

Beri-beri is an acute infectious disease with a definite primary lesion.

The reasons which led me to this conclusion are: (1) That the disease begins after an incubation period of ten to twenty days, with more or less marked symptoms of gastro-duodenal irritation, often diagnosed as simple indigestion; (2) that the gastro-duodenal syndrome is accompanied or soon followed by various

degrees of sensori-motor and autonomic paralysis; (3) that this syndrome lasts from twenty to forty days, during which time death may ensue (acute pernicious and acute beri-beri), and that otherwise the cases either recover altogether or pass into a state of residual paralysis. I have made a large number of *post-mortem* examinations upon beri-beri cases, and have found that only in the acute stage of the disease autopsies showed a more or less marked gastro-duodenitis, with hæmorrhagic injection of the crests of the valvulæ conniventes. Microscopically a varying degree of necrosis of the mucosa was discovered, accompanied by more or less marked signs of acute inflammation, and in the necrosed mucosa a special bacillus of constant morphological character was found. These changes were not observed in the residual stage of the disease; and I believe that beri-beri is thus analogous to diphtheria, in that it is an acute disease with a definite local lesion, from which a toxin is disseminated throughout the body.

Although I have not actually demonstrated that the bacillus seen in the gastric and duodenal mucous membrane escapes in the intestinal discharges, I have assumed both that this is the case and that it is by this means that the spread of beri-beri takes place.

Acting on these conclusions, I made in 1902 certain recommendations with reference to the mode of life and hygienic surroundings of the prisoners in the Kuala Lumpur gaol. More than two years have elaped since the application of the preventive measures which I advocated was begun—time enough to test their efficiency. I have been unable myself to watch the effect of the new *regime*; I am therefore greatly indebted to my successor, Dr. C. W. Daniels, for a report of the results, from which I have quoted freely in the following account.

The various hygienic reforms which came into force between May and September, 1902, were as follows:—

(1) All prisoners were employed during the greater part of the day at extramural work.

(2) The whole gaol was thoroughly ventilated, all the air inlets and outlets being enlarged.

(3) The gaol has been thoroughly disinfected several times.

(4) Under the old *regime* the prisoners defæcated and urinated in their cells.

(5) The prisoners formerly ate their meals with their fingers, in their cells. This source of infection has been ended in the gaol. Since May, 1902, all meals except the evening meal at 5 p.m. are partaken of outside the cells. Since April 9th, 1904, all meals have been eaten outside of the cells.

These reforms were instituted between May and September, 1902, and it is fair to assume that they became effective about September. As a result the number of acute cases fell from 28 in September, 1902, to none in February, 1903, and for seven consecutive months no fresh case occurred. Towards the end of 1903 four cases occurred; of these two had been in gaol for two months, and one for thirty-seven days. If we admit the possibility of an incubation period of two months, it is possible that these patients contracted the disease before admission to the gaol. In the first four months of 1904 only three certain cases of acute beri-beri occurred; two of them had been in gaol for seven months and one for over a year.

The disappearance of the disease was not due to a general diminution of the disease throughout the Malay Peninsula, as the reports show that, while extramural beri-beri remained epidemic, the intramural disease diminished and finally disappeared.

The abolition of beri-beri in the gaol hospital has been attained by hygienic reforms founded on the view which I have advanced that the infective agent is contained in the excreta of the patient during the acute stage of the disease and that infection results from fæcal contamination. I would suggest that, as an additional preventive measure, the stools of those suffering from acute beri-beri be disinfected.

It should not be forgotten that, from May 1st, 1902, to the present time, the prisoners have been on a diet of lower grade in the nitrogen content than obtained during the previous year or so, during which beri-beri was almost epidemic. This fact should set at rest the question of diet as a factor in the causation of beri-beri.

CEREBRO-SPINAL MENINGITIS AT ZUNGERU AND YOLA IN NORTHERN NIGERIA.

(*Forwarded for publication by the courtesy of the Secretary of State for the Colonies.*)

REPORT ON AN OUTBREAK OF EPIDEMIC CEREBRO-SPINAL MENINGITIS IN ZUNGERU DURING FEBRUARY AND MARCH, 1905.

By the Principal Medical Officer of the District.

The increased mortality among the natives in and around Zungeru, and rumours of an excessive death-rate in Kano, Zaris, Ilorin, and several of the smaller villages attracted much attention about the middle of February. Small-pox was epidemic at the time, and at first it was thought that the deaths were due to this disease, the natives themselves calling the sickness "small-pox fever." It was gathered that outbreaks such as this, though not of annual occurrence, were by no means uncommon during the first three months of the year, and were supposed to be due to the excessive dryness of the season. All evidence pointed to an enormous case mortality, and the natives stated that in some years cattle, in others men, and sometimes both cattle and men, were attacked.

At first no cases of the disease could be found, all the earlier cases running such a rapid course that death occurred within a few hours, and owing to the native's habit of hiding himself when ill, the first intimation usually received was that a dead body had been found, and no information was obtainable as to what had been the cause of death. *Post mortems* were made where possible, but nothing was discovered but intense congestion of the vessels of the cerebral cortex.

A case of cerebro-spinal meningitis was admitted to the native hospital earlier in the month, and this was thought to be a sporadic one, but after the lapse of a week many nervous cases arrived, all corresponding more or less with the first, and on February 28th a native clerk was admitted with the classical symptoms

Lieutenants of the Indian Medical Service who recently completed a Course of Instruction in the Royal Victoria Hospital, Netley, and the Royal Army Medical College, London.

Lieutenants :—Falk. Buckley. Boalth. Reaney. (1st Montefiore prize.) Coppinges. MacWalters. W. H. Hamilton. R. K. White.

Lieutenants :—Soltau. O'Neill. (Maclean prize.) A. D. White. (Martin Medal.) COLONEL MACLEOD. A. F. Hamilton. Wilson. (Webb medal and 2nd Montefiore prize.) Cunningham.

of the disease. He died within twenty-four hours of admission, and the diagnosis was fully borne out at the autopsy. Epidemic cerebro-spinal meningitis was then decided on as a working hypothesis for the investigation of the epidemic. The health officer was instructed to search the native town, and send into hospital all cases of a doubtful nature for observation, and a house-to-house visitation was made.

Eight cases of the disease were discovered, which were placed in a temporary segregation hospital, and sanitary measures were taken to prevent its further spread as far as possible, these measures consisting in burning or disinfecting all houses from which cases had been taken, in opening up the more crowded portions of the town, and in isolating all fresh cases. I append a chart which shows graphically the admissions, deaths, mean temperature, and relative humidity during March.

Etiology.—During the earlier part of the year many fires had occurred in the native town, destroying great numbers of the grass huts and driving the inhabitants into the remaining houses, with the result that portions of the town had become greatly overcrowded. This condition of affairs undoubtedly contributed to the spread of the disease after its introduction, but whether the disease is endemic in a mild form and occasionally becomes epidemic, or whether the disease has been introduced from without, there is no evidence to show. The former is probably the correct explanation, though no previous case has been recorded in Northern Nigeria.

Clinical Picture.—The following is a clinical picture of the average case founded on the signs and symptoms observed in the first seventeen cases which were admitted to the segregation hospital.

The patient when first seen is lying on his side with one or both knees slightly drawn up, his back is arched backwards, and his head retracted. He is generally only semi-conscious, but can be roused, and then moans and stares rather wildly, with an anxious expression on his face. If he can be induced to rise he does so in a characteristic manner, first rising to his knees and then to his feet, keeping the head, neck, and trunk rigid during the operation. If an effort is made to raise the head when he is recumbent the whole of the head, neck, and trunk is raised by the same action, and when having to enter a low doorway he sinks gradually to his knees, and in this attitude shuffles in with head thrown back and spine rigid. When in the erect posture he sways and grasps at the nearest means of support. On being questioned he complains of severe pain at the back of the head, and of pain in the lumbar and dorsal regions. Pressure on the neck below the occiput on the posterior neck muscles and on the cervical spine is obviously painful, but tenderness of the dorsal and lumbar parts of the spine is not so marked, though generally present. Pains in the limbs are by no means uncommon. Kernig's sign could be elicited in nearly every case, and photophobia was a pretty constant symptom. Strabismus was absent, though curiously enough it was present in the first case observed, where it had existed from childhood. Vomiting was a pretty constant symptom in the earlier cases. The temperature is generally not high, running from 100° to 103°. Pulse about 60, and strong as a rule.

After about twenty-four hours, in cases running an unfavourable course, the stupor or somnolence gives place to delirium, the patient becomes very restless, noisy, and sometimes violent. He cannot remain in one position for more than a few seconds. The temperature swings irregularly from perhaps 97° in the morning to 102° or 103° in the evening. Later, if he lives, relapses are noticed following hard on one another. Pulse generally slow but strong. Still later, about the third day the patient sinks into a stupor, gradually deepening into complete coma. The conjunctivæ become congested, and the face somewhat bloated. Herpetic eruptions may appear on the lips and face, the respiration becomes sighing, the teeth covered with sordes, and the tongue dry and brown, and the patient gradually sinks into an adynamic state which terminates in death. In most cases a yellowish discharge exuded from the mouth, nose, and eyes about twelve hours before death, and the breath sounds are obscured by loud moist râles which may be heard at some yards distance.

The malignity of the disease varies a good deal, death occurring sometimes within twenty-four hours, but the majority of deaths occurred after four or five days' illness.

The following tables show the occurrence of the commoner symptoms in thirty-two instances. The column showing the number of days each patient was sick before admission to hospital, though generally correct, cannot be vouched for in every instance, as information obtained on purely native evidence is not always accurate.

The three charts attached show the irregular character of the fever.

Morbid Anatomy.

Details of the *post-mortem* examinations made during the epidemic are given below.

(1) James Mousa, aged 23, native clerk, died March 1st, 1905. This man died after three days' illness. The autopsy was made about twelve hours after death.

Head.—The vessels of the scalp were much injected. The pia-arachnoid was much congested. Patches of lymph and purulent exudate were scattered over the cortex and in the cortical sulci. A large quantity of purulent exudate was seen around the cerebellum and all over the base of the brain, bathing the emerging basal nerves. It also welled up around the divided cord, and where a portion of the spinal column was removed in the dorsal region patches of purulent exudate were found chiefly on the posterior surface of the cord.

Thorax.—Large fibrinous clots were seen in the auricles of the heart extending through the mitral and tricuspid valves. The ventricles were nearly empty. The venæ cavæ were distended with blood. The heart weighed 11 ozs. The lungs were both slightly congested. The pleuræ and pericardium were normal.

Abdomen.—The stomach showed a good deal of congestion, and a few petechial hæmorrhages were noted on the mucous membrane. The liver weighed 46 ozs., the left kidney 5 ozs., the right kidney 5½ ozs., and the spleen 9 ozs.

(2) Mormoh, aged 23, horse boy, died March 2nd,

SYMPTOMATIC TABLE NO. 1 OF SEVENTEEN EPIDEMIC CASES.

No.	Name	No. of days sick before admission	Date of admission sick	Date of discharge	Age	Sex	Occupation	Race	Headache	Retraction of head	Tenderness of nape and neck	Tenderness of spine	Delirium	Coma	Kernig's Sign	Herpes	Photophobia	Conjunctivitis	Discharge from eyes	Vomiting	Remarks
1	Jundi ..	2	14.2.05	..	21	M	Pauper	Yoruba	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	No	No	Yes	Doing well.
2	Ari Kukuwa	1	17.2.05	..	17	M	Recruit	..	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,,	,, ,, but quite deaf.
3	Kolo ..	1	27.2.05	..	22	M	Soldier	Yoruba	,,	,,	,,	,,	,,	,,	,,	,,	No	Yes	,,	,,	,, ,, ,, ,,
4	Marmah ..	2	28.2.05	..	32	M	Interpreter	,,	,,	,,	,,	,,	,,	,,	,,	Labialis	Yes	,,	,,	No	,, ,, ,, ,,
5	Balon Flingy	3	25.2.05	..	24	M	Policeman	,,	,,	,,	,,	,,	,,	Not deep	,,	No	,,	,,	,,	,,	,, ,, ,, ,,
6	Omomeji ..	1	2.3.05	5.3.05	21	M	Mason	,,	,,	,,	,,	,,	,,	Yes	Not marked	Labialis	,,	,,	Yes	Yes	Died.
7	Bamaiye ..	2	1.3.05	..	18	M	Horse boy	Housa	,,	,,	,,	,,	,,	,,	,,	Labialis & facialis	,,	,,	,,	,,	
8	Saba ..	2	2.3.05	..	20	..	Pauper	Nupe	,,	,,	,,	,,	,,	,,	,,	No	,,	,,	,,	,,	Sinking.
9	Jemma ..	3	2.3.05	..	23	..	,,	Yoruba	,,	,,	,,	No	No	,,	Yes	,,	,,	,,	,,	No	
10	Yanna ..	2	2.3.05	7.3.05	35	F	Trader's wife	Nupe	,,	,,	,,	Yes	Yes	,,	,,	,,	No	No	No	Yes	Died.
11	Saiami ..	..	2.3.05	2.3.05	22	..	Pauper	Yoruba	?	,,	?	?	No	,,	No	,,	?	Yes	Yes	,,	Admitted *in extremis*.
12	Amadu ..	2	2.3.05	..	21	..	,,	,,	Yes	,,	Yes	Yes	Yes	,,	Yes	Labialis	Yes	No	No	No	
13	Adawnyi ..	3	3.3.05	..	20	..	,,	,,	,,	,,	,,	,,	No	,,	,,	No	,,	,,	,,	Yes	Developed parotitis.
14	Alabi ..	2	3.3.05	7.3.05	17	..	Steward	,,	,,	,,	,,	,,	Yes	,,	,,	,,	,,	,,	,,	,,	Died.
15	Balali ..	2	3.3.05	..	20	..	Labourer	,,	,,	,,	,,	,,	,,	No	Not marked	,,	,,	Yes	,,	No	
16	Esa	2	5.3.05	7.3.05	23	..	Pauper	Nupe	..	,,	..	..	No	Deep	Yes	,,	..	,,	Yes	Yes	Died ; admitted *in extremis*.
17	Magagi ..	1	6.3.05	..	25	..	Ex-slave	Housa	Yes	,,	Yes	Yes	No	No	Not marked	,,	No	No	No	No	Doing well.

POST-MORTEM EXAMINATIONS OF CASES OF CEREBRO-SPINAL MENINGITIS.

No.	Name	Age	Sex	Race	Date of Admission	Date of Death	Duration of illness in days	Membranes: Dura	Membranes: Pia	Brain: Convexity	Brain: Base	Brain: Interior	Lungs	Heart	Liver	Spleen	Condition of Body	Hours after death P.M. made	Temperature P.M.	Remarks
1	Sgt. Nettle-fold	..	..	E	..	24.3.05	..	Thick'ning	Congest. and thick'ning	Pus on surface	Pus	Pus on ventricle	..	..	..	..	Advanced decomposition	51		
2	Morro ..	..	..	..	..	25.3.05	..	Congest.	Congest.	..	..	..	Both pneumonic	..	Inflamed	Congest.	Well nourished	..	..	Found dead in town.
3	Digi ..	14	..	Yor.	23.3.05	25.3.05	2	..	,,	Covering of lymph	Pus	Congest.	Congest.	..	..	..	,,	6		
4	Popola ..	25	..	,,	27.3.05	27.3.05	8 hrs.	..	,,	Pus	..	..	,,	..	Congest.	..	,,	9		
5	Ogomula ..	36	F	,,	27.3.05	28.3.05	1	Thick'ning	,,	,,	..	Distension of ventricles	,,	..	..	..	Emaciat'd	8	..	There was considerable destruction of cortex from ulceration.
6	Kaderi ..	32	..	,,	26.3.05	28.3.05	2	..	..	,,										
7	Brihima ..	18	..	,,	21.3.05	29.3.05	8	Thick'ning	Congest.	,,	Pus	Pus in ventricles	Congest.	..	Congest.	Congest.	Well nourished	1	Very high	
8	Sariki Dogo Zaria	27	..	H	28.3.05	30.3.05	2	,,	,,	,,	,,	..	Old pleurisy, congest.	..	,,	..	,,	6		
9	Sanusi ..	6	..	Y	27.3.05	31.3.05	4	Marked thick'ning	Intense congest.	,,	Pus	Pus in ventricles	..	..	..	..	Emaciat'd	1		
10	Lawani I. ..	20	..	,,	31.3.05	1.4.05	2	..	Congest.	,,	,,	,,	Congest.	..	Congest.	Congest.	Well nourished	4		
11	Lawani II...	29	..	,,	31.3.05	2.4.05	2	Thick'ning congest.	Thick congest.	,,	,,	..	Congest.	..	..	..	,,	6		
12	Faluma ..	30	F	,,	30.3.05	3.4.05	3	..	Intense congest.	,,	,,	Pus in ventricles, distended	Slight congest.	Enlarged, fatty.	Congest.	Congest.	,,	1	High	

1905. This man died after four days' illness. The autopsy was made about three hours after death.

Head and Spine.—The pia-arachnoid was deeply injected. Patches of purulent exudation were found over the whole brain, markedly over the pons, cerebellum and medulla, and about the basal nerves. The brain substance was anæmic. A small quantity of purulent material was seen in the posterior cornua of the right lateral ventricle. Pus was found all around the divided cord and a thick layer under the congested

4 ozs. of reddish fluid, mixed with bile. The rest of the alimentary tract was normal. The right kidney weighed 4½ ozs., the left 4 ozs. The spleen weighed 7 ozs.

(3) Djoah, aged 7, female, died March 1st, 1905. This child had been sick four days. The autopsy was made twelve hours after death. *Post-mortem* rigidity was absent.

Head and Spine.—The pia-arachnoid showed much congestion. The whole surface of the cortex was

SYMPTOMATIC TABLE No. 2 OF THIRTY-TWO EPIDEMIC CASES.

Name	Date of admission	Date of discharge	Age	Sex	Occupation	Race	Headache	Retraction of head	Tenderness of nape and neck	Tenderness of spine	Delirium	Coma	Kernig's sign	Herpes	Conjunctivitis	Discharge from eyes	Remarks; died
Sumanu ..	11.3.05	..	24	..	Lab'rer P.W.D.	Yoruba	Yes	..	Yes	Yes	..	..	No	..	..	..	15.3.05
Eyaye ..	11.3.05	25.3.05	..	..	Pauper	..	,,	Yes	..	..	..	..	,,				
Phillips ..	15.3.05	..	22	..	,,	..	..	,,	..	..	..	Unconscious	Yes	..	..	..	18.3.05
Ginabu ..	18.3.05	..	25	F	,,	..	..	,,	..	..	..	,,	,,	Yes	..	..	19.3.05
Adebum ..	,,	..	23	..	,,	..	..	,,	..	..	..	,,	..	..	..	..	20.3.05
Obuaday ..	,,	..	28	..	,,	..	..	,,	..	..	Yes	..	Yes	..	Yes	..	25.3.05
Gana	,,	..	17	..	,,	Yoruba	..	,,	..	..	,,	..	,,	..	..	Yes	25.3.05
Ojile	21.3.05	..	20	..	Tel. messenger	,,	..	,,	..	..	..	Unconscious	..	..	..	..	24.3.05
Ibrihima ..	,,	..	22	..	Pauper	,,	..	,,	..	..	..	,,	Yes				
Alowa ..	22.3.05	..	26	..	Police	,,	..	,,	..	..	..	,,	,,	..	..	..	27.3.05
Anknoun ..	,,	..	30	..	Pauper	..	..	..	..	..	..	Yes	..	..	..	..	22.3.05
Owdu Keffi ..	23.3.05	..	25	..	Police	..	..	Yes	..	..	..	Unconscious	Yes	Yes	..	..	24.3.05
Desomu ..	24.3.05	28.3.05	25	..	Carrier	Yoruba	Yes	..	Yes	..	..	..	..	,,			
Brimah ..	,,	..	18	..	Tel. messenger	,,	..	Yes	..	..	..	Unconscious	..	..	..	..	29.3.05
Momada ..	23.3.05	..	21	..	Niger Co.	Nupe	..	,,	Yes	Yes	..	..	Yes	Yes	Yes		
Agabona ..	,,	..	28	..	,,	,,	..	,,	..	..	..	Unconscious	Yes				
Esa	,,	..	50	..	Pauper	..	..	,,	..	..	..	,,	..	..	..	..	23.3.05
Danbo Vano	24.3.05	..	22	..	,,	..	..	,,	..	..	..	,,	..	..	..	..	26.3.05
Digi	,,	..	14	..	Boy Police	Yoruba	..	,,	..	..	..	,,	..	..	..	..	25.3.05
Awodu Boukbi	,,	..	24	..	Soldier	Housa	Yes	,,	Yes	..	..	..	No				
Musa Lago ..	25.3.05	..	26	..	Soldier	,,	,,	..	,,	..	..	..	,,	..	Yes	..	Acute pharyngitis
Popola ..	27.3.05	..	25	..	Police	Yoruba	..	Yes	..	..	..	Unconscious	Yes	..	..	..	27.3.05
Kaderi ..	26.3.05	..	32	..	Lab'rer P.W.D.	,,	..	,,	..	..	..	,,	..	..	..	..	28.3.05
Seberrho ..	,,	..	10	..	Pauper	,,	..	,,	Yes	Yes	..	..	Yes				
Ogonsla ..	29.3.05	..	36	F	,,	,,	..	,,	,,	,,	..	Semi-uncon.	,,	..	Yes	Yes	28.3.05
Sanusi ..	,,	..	10	..	,,	,,	..	,,	,,	..	..	..	,,	..	..	..	31.3.05
Sani Gunda ..	28.3.05	..	18	..	Soldier	Housa	Yes	,,	,,	..	..	..	No				
Sariki Dogo Zaria	,,	..	27	..	,,	,,	..	..	..	..	..	Yes	..	..	..	..	30.3.05
Fatuma ..	30.3.05	..	25	..	Pauper	Yoruba	Yes	Yes	Yes	..	..	Semi-uncon.	Yes	Yes	..	..	3.4.05
Inday ..	,,	..	18	..	Lab'rer P.W.D.	,,	,,	,,	,,	Yes	..	..	,,				
Lawani I. ..	31.3.05	..	20	..	,,	,,	..	,,	..	..	Yes	..	,,	..	..	..	1.4.05
Lawani II. ..	,,	..	29	..	,,	,,	..	,,	..	..	,,	..	,,	..	..	..	2.4.05

membranes of the lumbar cord behind, the exudate being less marked on the anterior surface.

Thorax.—The heart weighed 12 ozs. The left ventricle was hypertrophied, and the right dilated. The mitral valves showed thickening, the ventricles were empty. The auricles contained large fibrinous clots extending through the mitral and tricuspid valves, the venæ cavæ were engorged, the pericardium was congested and coated with patches of lymph. It contained about 2 ozs. of reddish-yellow fluid. Both lungs were much congested. The pleuræ were normal.

Abdomen.—The liver weighed 50 ozs. The stomach showed a good deal of congestion, and many petechial hæmorrages on the mucous surface. It contained

covered with purulent exudate. The cerebellum and medulla were thickly coated and a thick layer was seen over the base of the brain and around the cut cord. Congestion of the membranes of the dorsal cord was likewise seen, as well as patches of exudation over the posterior surfaces, though the anterior surface was free from exudate.

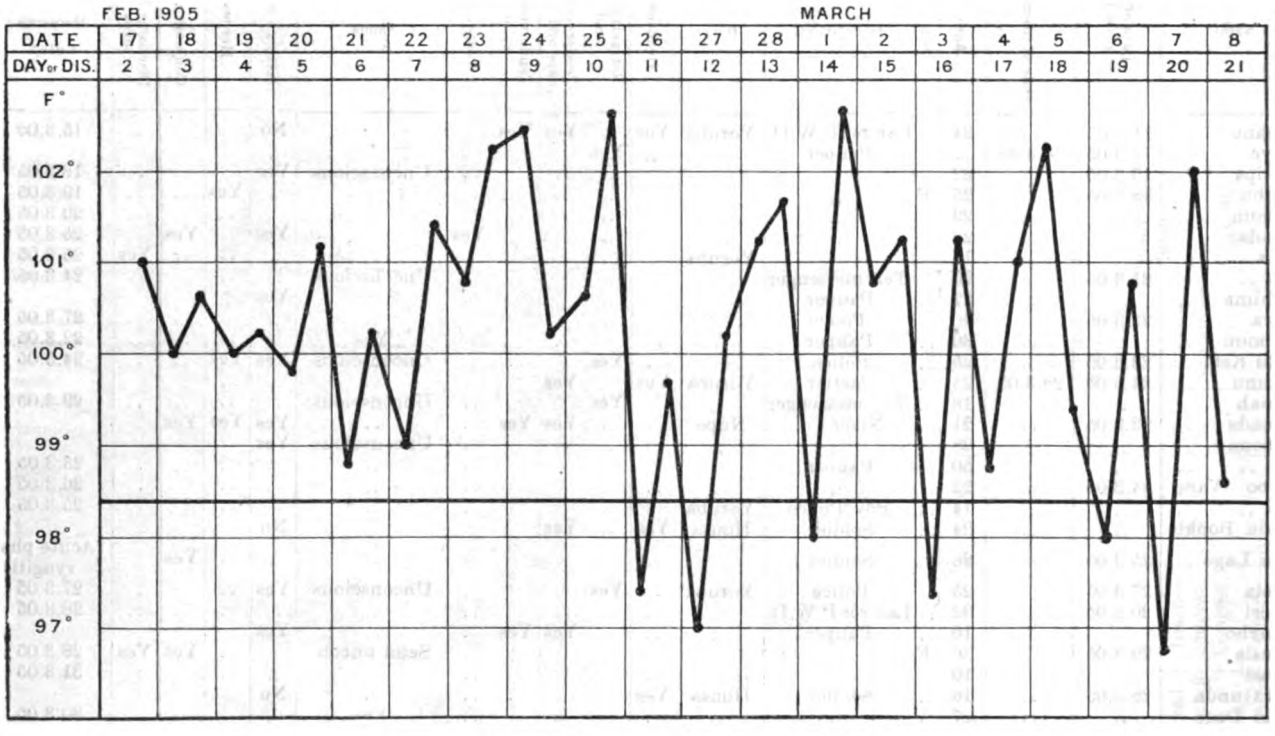
Thorax.—The heart weighed 5½ ozs. The ventricles were empty. The right auricle contained a large clot, the left was empty. The venæ cavæ were engorged with blood. The lungs, pleuræ, and pericardium were normal.

Abdomen.—Except that the stomach contained a coating of glairy mucus, the abdominal organs showed nothing worthy of note.

(4) Brimah, aged 18, horse boy, died March 1st, 1905. This boy had been ill since the February 15th. The autopsy was made three hours after death.

Head and Spine.—The brain was covered with patches of purulent exudate. The pia-arachnoid was injected, but not markedly. The basal nerves were bathed in the exudate, and it was seen in great quantity over the pons, medulla, and upper portion of the cervical cord. A thick layer was seen on the posterior aspect of the lumbar cord, and a smaller quantity in patches on the anterior aspect.

Thorax.—The heart weighed 10 ozs. The right auricle contained a large fibrinous clot, the left a smaller clot. The venæ cavæ were full of blood.



Temperature chart of No. 2 in symptomatic table.

Pericarditis existed to a marked degree. The lungs were both congested, the right markedly.

Abdomen.—The stomach was coated with glairy mucus, and showed many small petechial hæmorrhages. There was also marked congestion of the inferior portion. The liver weighed 51 ozs., the right kidney 5½ ozs., and the left 5 ozs. The spleen weighed 10 ozs.

(5) Awudulai, aged 22, male pauper, died March 2nd, 1905. This man had been sick three days. Autopsy was made twelve hours after death.

Head and Spine.—A yellowish, thick fluid streamed from both eyes. Conjunctivitis was present on each side. The lips were covered with herpes, and a patch of facial herpes was seen on the left malar region. There was keratitis present in both cornea. The pia-arachnoid was much injected, and patches of purulent exudate covered the sides and top of the brain, which rested in a bath of the same material. Both ventricles (lateral) contained a small quantity of the exudate. The exudate was found in smaller quantities around the divided cord, and covering the dorsal and upper lumbar portions on their posterior aspects.

Thorax.—The heart weighed 12 ozs. The auricles contained clots, the mitral valves showed thickening, and the left ventricle hypertrophy. The venæ cavæ were engorged with blood. Pericarditis was very marked. Broncho-pneumonia was present in both lungs, and the posterior inferior portion of the left pleura was much congested.

Abdomen.—The stomach was coated with glairy mucus, and showed petechial hæmorrhage here and there in its lower part. It contained about 4 ozs. of reddish fluid. The liver weighed 49 ozs., the spleen 6 ozs., right kidney 4½ ozs., and left 4 ozs.

(6) (*a*) Native, aged 45 approximately, male, died March 3rd, 1905. Full details of this and the two cases following could not be obtained. The man was said to have sickened and died in one day. Autopsy was made about twelve hours after death.

Head and Spine.—The vessels of the scalp and pia-arachnoid were intensely injected, as also were the membranes of the dorsal cord. No purulent exudation was seen.

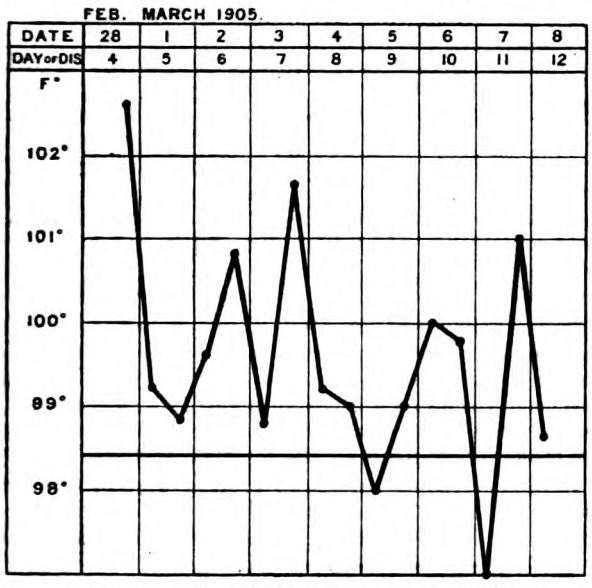
Thorax.—The heart weighed 10 ozs. The lungs were both congested, the right markedly. The pleuræ and pericardium were normal.

Abdomen.—The stomach showed a coating of glairy mucus and slight congestion. It contained a little reddish fluid. The liver weighed 50 ozs., the right kidney 5 ozs., the left 5 ozs., the spleen 9 ozs.

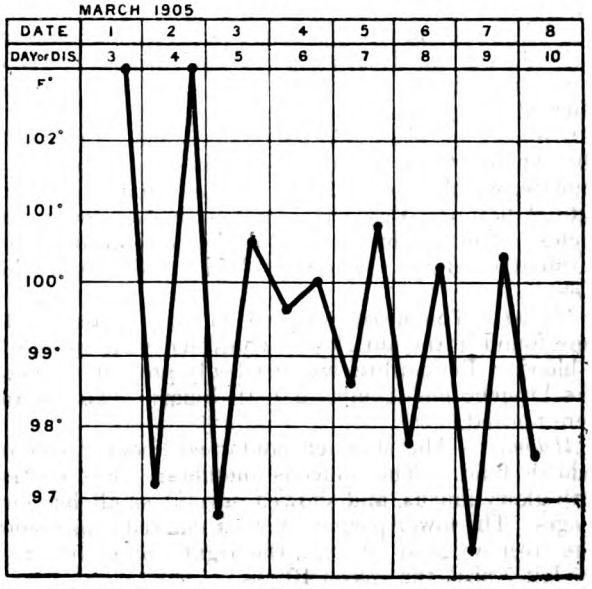
(*b*) Native, aged 24 approximately, male, died March

3rd, 1905. The man was said to have sickened and died in one day. Autopsy was made about thirteen hours after death.

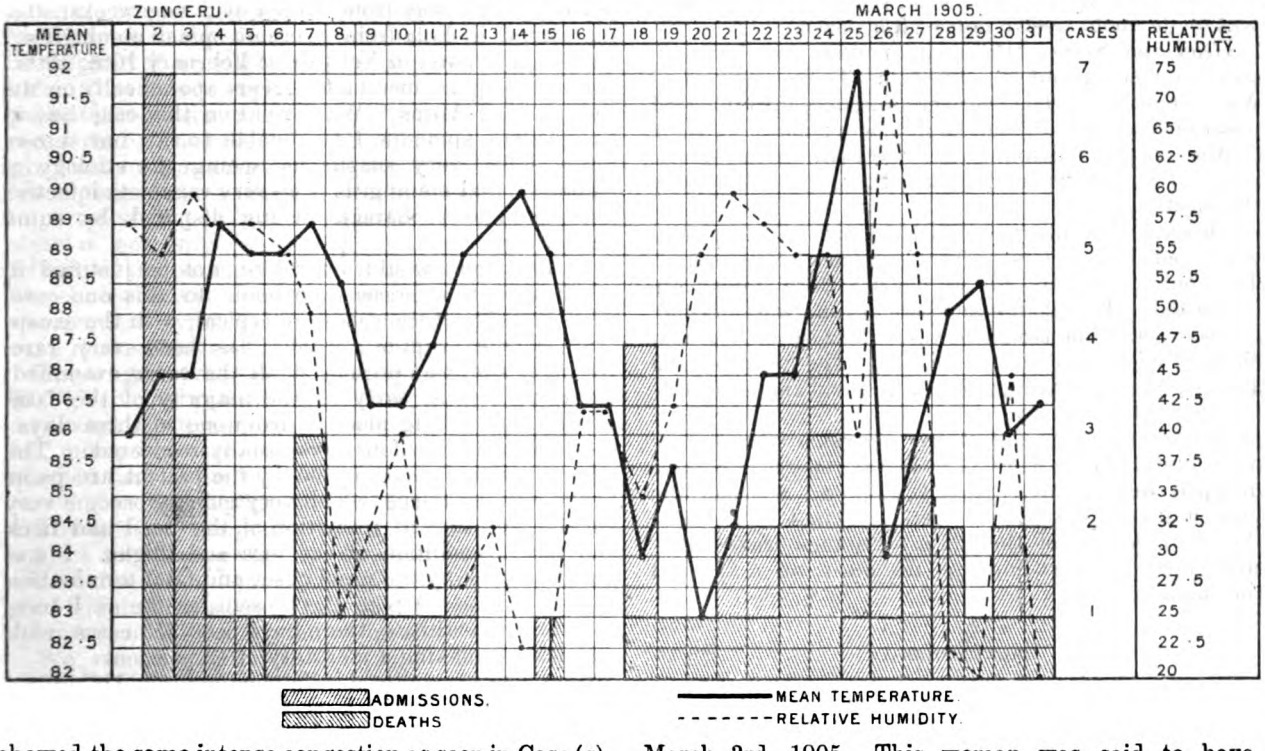
Head.—The vessels of the head and pia-arachnoid showed the same intense congestion as seen in Case (*a*). The congestion of the membranes of the dorsal cord was less marked. No pus was found on the brain or cord.



Temperature chart of No. 5 in symptomatic table.



Temperature chart of No. 7 in symptomatic table.



Thorax.—The heart weighed 10 ozs. The right and left auricles contained clots; the venæ cavæ were engorged. The lungs both showed slight congestion.

Abdomen.—The stomach showed a little congestion, and a coating of mucus. The liver weighed 50 ozs., the right kidney 5½ ozs., the left 5 ozs., the spleen 10 ozs.

(*c*) Native, aged 25 approximately, female, died March 3rd, 1905. This woman was said to have sickened and died in one day. The autopsy was made about twelve hours after death.

Head and Spine.—Like the other two cases, congestion of the scalp vessels and of the pia-arachnoid was very intense. The spinal membranes were also implicated, being very markedly congested.

Thorax.—The heart weighed 9 ozs. The auricles

were distended with clots. The ventricles were empty. The great veins were engorged. The pericardium showed early congestion. Both lungs were congested.

Abdomen.—The liver weighed 45 ozs., the right kidney 4½ ozs., the left 4 ozs., the spleen 6 ozs. All the abdominal organs appeared normal in character.

(7) Salami, aged 22, pauper, died March 2nd, 1905. Duration of illness not known. Autopsy made twelve hours after death.

Head.—The pia-arachnoid was much congested. The whole of the brain was covered with purulent exudate, which extended into the sulci and the longitudinal fissure. Pus was found in both lateral ventricles. The lumbar cord was found embedded in purulent exudate. Yellowish fluid exuded from the eyes.

Thorax.—The heart weighed 11 ozs. Large clots were found in the auricles. The venæ cavæ were full of blood. Pericarditis was markedly present. There was broncho-pneumonia in both lungs. The pleuræ were normal.

Abdomen.—The stomach contained about 2 ozs. of reddish fluid. The mucous membrane was coated with glairy mucus, and showed several small hæmorrhages. The lower portion showed marked congestion. The liver weighed 54 ozs., the right kidney 5½ ozs., the left 5 ozs., the spleen 10 ozs.

(8) Omamegi, aged 21, mason, died March 5th, 1905. This man was ill four days before death. The autopsy was made about twelve hours after death.

Head and Spine.—Purulent exudate was found in patches over top and sides of brain. The pia-arachnoid was congested. The cerebellum, pons, medulla, and basal nerves were all bathed in the exudate. A thick coating of pus was found over the cord in the dorsal region. A yellowish, thick discharge streamed from the orbits.

Thorax.— The heart weighed 10½ ozs. The auricles contained large clots. The ventricles were empty. The venæ cavæ were full of blood. Both lungs were congested. The pleuræ and pericardium were normal.

Abdomen.—The stomach was lined with mucus, and showed a few small hæmorrhages. The liver weighed 46 ozs., the right kidney 5 ozs., the left kidney 5 ozs., the spleen 9¼ ozs.

That some cases die of hyperpyrexia is probable, as in one instance where a man was reported to have dropped dead, and a partial autopsy revealed the unmistakable presence of cerebro-spinal meningitis, the temperature of the brain substance was higher than 110° F., the limit of the scale on a clinical thermometer.

Bacteriology.

The bacteriological evidence was inconclusive in that all the evidence obtained was derived from the morphological characters of the organisms found.

Smears were taken or films made from the nasal discharge, the purulent exudate on the brain surface, and the cerebro-spinal fluid both in the living patient and the cadaver.

At least six specimens were made of each, and stained variously by carbol-fuchsin, Jenner's stain, and Gram.

In every case diplococci were found without difficulty, which were decolourised by Gram's method.

The exudation in the brain surface was found to contain fibrous material, polynuclear leucocytes, pus cells, and diplococci, which were usually seen within the leucocytes, though occasionally free.

The nasal discharge contained numerous diplococci, but also numerous other bacilli.

No culture media were available, so that no further investigation into the character of the organisms was possible.

REPORT OF THE OUTBREAK OF CEREBRO-SPINAL MENINGITIS AT YOLA.

By Kenneth McGahey, L.R.C.P., L.R.C.S (Edin.).

About February 12th, 1905, I accidently heard that many deaths were occurring in Yola town from a disease unknown to the natives. I accordingly visited Yola, and examined a great number of those affected. I discovered that *epidemic cerebro-spinal meningitis* had broken out amongst them. The natives do not recollect, nor have they heard of, any such disease ever having occurred before. How it has been introduced I have been unable to ascertain. At Malabon and Virabon, some twenty and twenty-five miles distant respectively, I am informed that similar cases are occurring, and an Arab who passed through these places on his way from Mecca died two weeks after his arrival in Yola from "cerebro-spinal meningitis," he having arrived in Yola about February 10th, 1905.

Cerebro-spinal meningitis occurs sporadically on the east coast of Africa. What relation this case has to the present epidemic I am unable to say, but it certainly looks very suspicious, seeing the etiology of cerebro-spinal meningitis is so very vague, its infective and contagious character being disputed by some authorities.

I think one would, therefore, not be justified in attributing this present epidemic to this one case. The majority of the cases are typical, with the exception of the eruption, which has been very rare. Kernig's sign was present in all the cases examined. Delirium sets in early in the majority of the fatal cases, death taking place in from one to three days; those surviving for four days usually recovered. The first symptoms recognisable by the patient are pains in the neck and legs, which very quickly become very violent, resulting in retraction of the head and neck and flexed condition of the legs and thighs. I was greatly struck by the rapid onset and fatal termination of the disease. Up to the present, as far as I have been able to estimate, there have been 350 cases, with 150 deaths, making a mortality of 42 per cent.

Complications noticed were pneumonia and blindness (probably optic neuritis). I think the severity of the disease has greatly abated in Yola, but I now hear that several cases have occurred in the surrounding districts.

Up to the present we have had no cases at the Residency. I have issued instructions that the soldiers, police and staff are to have as little intercourse as possible with the inhabitants of Yola. Isolation of the patients in Yola has been attempted. I am urging the Emir to carry out my wishes.

Treatment.—Purgatives and opiates.

This epidemic has been no respecter of persons, young, old, male, female, rich and poor, all being alike attacked, and its distribution has not been confined to any single area.

A coincidence which may be worth mentioning is the fact that the three towns in which cerebro-spinal meningitis has occurred only use well-water for drinking; one native has just told me that he remembers an epidemic similar to this one occurring at Kukua some thirty years ago.

Up to the present I have had no opportunities of making any *post-mortem* examinations, but hope soon to do so. I am also carrying out some microscopic examinations. I may here state that, having seen a good number of cases of cerebro-spinal meningitis in America, I am pretty confident that my diagnosis of the present epidemic is a correct one.

AN OBSTINATE CASE OF OBSTRUCTION OF THE BOWEL—TREATMENT—RECOVERY.

By Major G. H. Fink, I.M.S., L.R.C.S., L.S.A.

Late Civil Surgeon, Bijnor District, N.W.P., and Oudh, and Prince of Wales's Hospital, Benares.

The various causes of bowel obstruction are too well known to the physician and surgeon to need any description of an elaborate kind, but that it is of great value to be able to rapidly and correctly diagnose your patient's condition, and to adopt surgical or medical measures for the relief of the wretched sufferer, every practical surgeon or physician must in the course of his experience have come to fully recognise the deep importance of. Delay in diagnosis of your patient's state is not only dangerous, but it shakes the confidence of the patient's friends and others, although in bowel obstruction it is always necessary to wait for some urgent symptom to justify surgical interference even in these days of antiseptic abdominal surgery.

The surgeon who has fully considered his case, and has given his patient all the opportunities which medicinal treatment can accomplish, must make up his mind, however, to operate ere the sufferer has reached that lowered stage when surgical interference would give him very little hope of recovery.

There is no complaint which the human body is subject to which gives rise to such intense suffering and anxiety as is depicted in the physiognomy of the poor sufferer, as powerful muscular contractions of the voluntary or involuntary muscular tissues.

We see it exemplified in cases of tetanus and hydrophobia, cholera, colic and bowel obstruction, death being welcome to continuance of intense agony.

I was called to see a patient one morning during my rounds by a police inspector, who stated that the poor sufferer had been in agonies for fifteen hours at a stretch—that the hospital assistant's and assistant surgeon's treatment had been tried without avail. On arriving at his bedside, the following was the history of the case:—

General History.—The patient was a tall, thin, spare individual, about fifty years of age, had always had a fair measure of health, his occupation being that of a cook.

Family History.—Nothing noteworthy.

Past State of Health.—Fair, except that he had had occasionally attacks of colicky pain, which were soon relieved with a purgative.

Present Illness.—Came on suddenly after a meal of *kitcherry*.

A dose of castor oil was administered by the master, by soon rejected by patient.

The hospital assistant and assistant surgeon had given enemas of castor oil, but without any good effect, and the patient was now suffering for fifteen hours from severe pain which was exhausting him rapidly, requiring a careful examination of his condition.

Present State.—A thin, spare and tall individual, decubitus dorsal, with an expression of great pain and anxiety on his countenance, rather a woe-begone appearance, with limbs outstretched.

Skin.—Cold, and clammy on surface.

Pulse.—Feeble, quick, regular, and becoming somewhat imperceptible.

Tongue.—Dirty yellow-brown on dorsum, red at tip, small, and very dry.

Temperature.—Subnormal.

Physical Examination.—Inspection: Muscular tension of abdominal muscles.

Palpation.—Hardness of a board over surface of abdomen generally, tenderness in the right lumbar and iliac regions, with hardness and resistance on pressure.

Percussion.—Dulness of abdomen generally. On lifting the thighs and flexing them on abdomen, he complained of pain on movement; but he felt relief in the position assumed, so this position was maintained to keep up relief.

The bowels were constipated, no desire to vomit, although a little nausea was present. No food of any kind was desired nor taken since the attack: thirst was great.

Diagnosis.—Obstruction of the bowel. Nature—doubtful, but in favour of scybalous mass impacted in the intestine.

Prognosis.—Somewhat unfavourable, owing to rapid exhaustion.

Treatment.—Rest in bed with the thighs flexed on abdomen and maintained in this position by pillows.

Strong beef tea with a little rum to be given every quarter of an hour in small quantities to maintain the strength and overcome rapid exhaustion.

Solid opium pill gr. i. to relieve pain and give the bowels rest, and to cause sleep to overcome exhaustion and pain after fifteen hours of unrest and agony.

Hot fomentations and turpentine over belly every hour, with massage in downward direction towards the pelvic outlet, with a little mustard oil to be rubbed over the abdomen with friction.

Result.—Relief, but not permanent. Patient seemed better in every way, so I ordered the following enema:—

℞ Castor oil	.. ..	ʒ iss.
Turpentine	.. ..	m. 40.
Warm water	.. ..	O iss.

Mix.—Sg. inject gently into the bowel *per rectum*.

Result.—One small scybala about the size of goat's dung and very hard. This indicated that there was a scybalous mass present; and if it could not be brought away by inducing action of the bowels, it would have to be broken down by mechanical means to remove the obstruction early, since perityphlitis or peritonitis might set in from the severe pressure exercised by such a hard mass.

I next ordered another enema, with no result this time.

I then injected glycerine ʒiv. into the bowel straight away, and in less than half an hour a huge motion occurred with scybalous masses in it. The injection of glycerine was repeated in two hours with a like result. Gentle massage over the belly with mustard oil and hot fomentations with turpentine were continued, and the patient made an excellent recovery, and is now happy.

Remarks.—It is worthy of note in this case that, although very prompt measures were required to relieve the patient from his agonising pain, it was also necessary to husband his strength, which had been so much lowered through the long continuance of his trouble, which had lasted fifteen hours ere I arrived at his bedside, since, whatever might be the cause of the obstruction, an operation under chloroform would have eventually been the only means of saving the patient's life, and the question would arise, "Has he got the strength to endure a severe operation or mechanical breaking down of the scybalous mass in the bowel?"

Nausea was present, be it remembered, and the case looked as if it were going on towards actual vomiting, if relief did not come very soon, and then operative interference would surely be called for if the patient could bear the operation, which might have been a protracted one or otherwise, depending, of course, on the nature of the obstruction.

The passage of the scybala was some reason for supposing it to be one of fæcal impaction; but the triumph was not due to enemas of castor oil and turpentine, but to glycerine injections in large doses of ʒiv. twice *per rectum;* the results were astonishingly rapid and effectual.

I feel also that the administration of solid opium in pills, together with the careful nourishment and small doses of stimulant at frequent intervals, gave strength to the patient's whole system, and enabled the bowel after rest to evacuate its contents, by the restoration of the nervous system which controls bowel action. This was only a common-sense method of reasoning out the probabilities of the case.

I feel that perhaps I would have acted more wisely if I had administered morphia instead of solid opium, for reasons which need no explanation; but as a rule natives indulge in opium as a prophylactic against various diseases; and had I failed in my wished-for effect of the opium pill, I would certainly have given morphia, hypodermically, a fair trial.

Now as to the question of massage and fomentation with turpentine and friction with mustard oil, perhaps it was somewhat heroic in the face of the conditions which were present in the bowel, with pain and tenderness; but had peritonitis actually set in, the patient's natural decubitus would have been very different to what it was, and the knees would have been instinctively drawn up to relieve pressure of the abdominal muscles. Moreover, there would surely have been a high temperature and a quick, wiry pulse. Massage doubtless helped to a great degree in supporting the peristaltic action of the bowels in the normal direction and driving the scybalous mass to the termination of the large intestine.

The *modus operandi* of the large doses of glycerine, so rapidly effectual in its results, might be explained in the usual manner, viz., abstracting fluid rapidly from the bowels and also from the fæcal mass itself which it perhaps percolates through and softens and breaks down in the process of abstracting water and softening, and so its triumph in this particular case.

This case will also illustrate the fact that you must treat your patient and not the disease only. It will also illustrate to the physician and surgeon the necessity of trying the simpler methods first before hastening into the graver ones, and it will also impress one with the fact that one large glycerine enema is not surrounded with the dangers of aperients and enemas which are so much deprecated in works by standard authors.

French Health Resorts—Annual Visit of Medical Men and Students—Voyages d'Etudes Médicales.—This year's visit will comprise the most important stations in the Western Pyrenees. It will start from Luchon on Friday, September 1st, and terminate at Arcachon on Thursday, September 14th. The price to be paid, which includes everything between these two places, is £12. There are no extras of any kind. The travelling is by first-class special train, and the accommodation is the best which each place has to offer. In order to reach Luchon, a ticket (first and second class) at half-price will be issued from any selected point on French territory, and a similar reduction will be made on the ticket from Arcachon to the point of departure from French territory. The district to be visited is remarkable for its extreme beauty and interest, and the stations for their therapeutic value. Among them are such well-known resorts as Luchon, Cauterets, Saint-Sauveur, Eaux Bonnes, Pau, Biarritz, Dax and Arcachon, together with many of minor importance, The particular features of each place are briefly described by Dr. Landouzy, Professor of Clinical Medicine at the University of Paris. Medical men (who may be accompanied by their wives), medical women and students in medicine, are eligible to take part in the trip. Names must be sent in so as to reach Paris on or before August 15th. They should be accompanied by the subscription (£12), which may be in the form of an ordinary English cheque payable to Dr. Carron de la Carriere, 2, Rue Lincoln, Paris; or to Dr. Leonard Williams, 8, York Street, Portman Square, W., from either of whom any further information may be obtained.

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THE

Journal of Tropical Medicine

JULY 15, 1905.

THE END OF THE NETLEY SCHOOL.

THE photograph which we issue with the current number of the Journal possesses an interest almost historic in its import, for, owing to the abolition of the Netley School, it represents the last of the thousands (3,000 in all) of medical officers who have received their special training there.

Since April 1st, 1863, all the medical officers of the Army have studied there, and from 1871 the medical officers of the Navy, until the school at Haslar was established in 1880, also went to Netley for their training. Not only may it be allowed all those who have known the Netley School, its traditions and associations, to lament the permanent closing of the institution, but when we consider the excellent work accomplished by the men who have taught and who have studied there, the fact that Netley as an educative centre will soon become merely a memory and tradition, however brilliant its successor may be, cannot be contemplated without a tinge of regret by the medical profession generally.

The Netley School will be best remembered by the fact that it gave to the world a new science, Preventive Medicine. Until Parkes, the Professor of Preventive Medicine in the Netley School, published his great work, our knowledge of hygiene was merely empiric, a collection of saws and wise sayings mostly by unwise folks. From Biblical times there had been practically nothing done to systematically advance hygiene, until Parkes established a basis on which to found hygiene and preventive medicine as a science. Had Netley done nothing more than to give us Parkes and his teaching, the reasons for its existence were amply justified.

Yet Netley originated another branch of medicine which has come markedly into prominence lately. Tropical medicine has formed a distinct part of the education of medical men joining the military services ever since the Netley School was founded, and was the only school at which the subject was taught in the country until a few years ago, when the London and Liverpool Schools came into existence. The men who taught in the School have left honoured names behind them. In addition to preventive medicine taught by Parkes, there were at the Netley School chairs of military medicine, military surgery and pathology, occupied and adorned respectively by Longmore, MacLean and Aitken. All these names were household words in the sphere of medicine a decade or two ago, and to military medical men each name serves to recall memories of revered teachers and of capable and brilliant specialists in their particular province.

In the centre of the group represented in the photograph will be seen the well-known features and figure of Colonel Kenneth Macleod, the last, but by no means the least, amongst the staff and teachers of the great School.

Since 1897 Colonel Macleod has occupied the Chair of Clinical and Military Medicine. He brought a ripe experience of well-nigh thirty years' earnest work in India to the Netley chair,

and with the closure of the School Colonel Macleod's work as a teacher ceases. No name stands higher in the modern annals of medicine and surgery than Colonel MacLeod's, and we hope in an early number to give a full account of the professional work he has accomplished in the service of his country.

While lamenting the disappearance of the Netley School, we hope and believe that the Royal Army Medical College in London will continue to fulfil its duty to and by the country, and will aspire to even greater excellence than that attained by the great School it has superseded.

LEISHMAN BODY FOUND IN CHINA.

Forwarded for publication by Dr. T. S. KERR.

THE readers of the JOURNAL OF TROPICAL MEDICINE will be interested to learn that the Leishman body has been found in a case of splenomegaly in Hankow, Central China.

Enlargement of the spleen, not associated with malarial parasites, is believed to be common in this district. Dr. Airde made splenic puncture in one of these cases and found in films prepared from blood so obtained the characteristic bodies.

The preparation was submitted by Dr. Thompson, of Hankow, to Sir Patrick Manson, who says there can be no question of the correctness of Dr. Airde's diagnosis.

THE MEDICAL PHASES OF IMMIGRATION LEGISLATION.

By V. G. HEISER, M.D.

IN a paper on this subject (*Medical Record*, June 17th, 1905), Heiser, Chief Quarantine Officer for the Philippines, gives a list of some of the more important diseases and ailments which would induce the medical officer, from hygienic and economic reasons, to reject an immigrant. Trachoma is, of all complaints, that which causes the greatest number of rejections. Then comes fevers, leprosy, and syphilis in its active stages. Tubercular cases, when the tubercle bacillus is found in the sputum, should be excluded. All persons mentally afflicted are mere burdens to the State. Persons suffering from valvular heart disease, hernia, chronic rheumatism, malignant disease, deformities, senility, debility, defective eyesight irremediable by glasses, and of poor physique generally, are useless as immigrants in a new country where life is likely to prove strenuous.

SECOND CONFERENCE OF THE CHINA MEDICAL MISSIONARY ASSOCIATION.

HELD AT SHANGHAI, FEBRUARY 5 TO 8, 1905.

Officers of the Association.

President, Dugald Christie, F.R.C.P., L.R.C.S. (Moukden); *Vice-President*, J. M. Swan, M.D. (Canton); *Secretary and Treasurer*, R. T. Booth, M.B., B.Ch. (Hankow); *Editors of Journal*, C. S. F. Lincoln, M.D., and W. H. Jefferys, M.D. (Shanghai). Dr. J. B. Neal was elected Chairman for the Conference.

Some forty delegates were present at the conference. The education and training of the Chinese in medicine was the chief subject dealt with at the several meetings of the sections.

It was resolved that the Journal of the Association, *The China Medical Missonary Journal*, be issued six times yearly instead of four times as heretofore.

The following reports of committees were presented:—

(1) A tract in English upon the treatment of the opium habit, presented by Dr. Boone.

(2) Information on the Chinese "Materia Medica," presented by Dr. Park.

(3) An appeal to the Home Board urging the appointment of two medical missionaries to every large centre, presented by Dr. Woodhull. Dr. Cousland presented the report of the Medical Nomenclature Committee.

The following papers were read during the conference:—

"The China Medical Missionary Association," by Dr. Neal.

"Tuberculosis of Joints," by Dr. J. H. McCartney.

"Opium Smoking in China," by Dr. Park.

"Abscesses and Ulcers," by Dr. E. I. Osgood.

"Diphtheria," by Dr. Wilkinson.

"Operative Methods for Urinary Calculi," by Dr. J. M. Swan.

"Liver Abscess," by Dr. Plummer.

"Malta Fever in China," by Dr. Boone.

"Medical Work among Children," by Dr. Lincoln.

"Artificial Respiration in Opium Poisoning," by Dr. Evans.

"Sanitary Work of the Japanese in Formosa, and their Plan of Campaign against Plague," by Dr. Maxwell.

"A Few Remarks on Obstetrical Cases," by Dr. Reifsnyder.

"Hernia and Fæcal Fistula," by Dr. Hearn.

"Self-supporting Medical Work," by Dr. Ida Kahn.

"Successful Surgery," by Dr. Meadow.

The next Conference will be held in 1907.

Review.

LE BERI-BERI. By Dr. H. VIVIAN Dangerfield. Paris: A. Maloine. 1905.

This book extends to 450 pages, and deals with the etiology, pathology, clinical aspects and treatment of beri-beri. Maloine is inclined to attribute the disease to a coccus which he terms the *Micrococcus beri-bericus*.

The author gathered his information from a study of 151 cases of beri-beri which has come under his observation during the past seven years.

Correspondence.

MERCURIAL POISONING CASE, NORTH-WEST RHODESIA.

TO THE EDITOR OF THE "JOURNAL OF TROPICAL MEDICINE."

A TRADER, W. H., aged about 45, provided himself at Benguela with some aperient powders, and the directions given were to take one at night if necessary, and take no salty food afterwards, and if it did not act well to repeat the dose the following night. If he had been able to read Portuguese he would have seen that each powder contained one gramme of calomel. When trading inland, near the source of the Zambesi, on January 4th, about 9 p.m., not feeling well, he took one of his powders. His mouth felt a little sore next morning, but the bowels reacted only slightly, so he repeated the dose, taking his second gramme of calomel on the evening of the 5th, twenty-four hours after the first dose.

He was awakened in the night with a burning pain, and his tongue became swollen and white, and saliva flowed continuously from his mouth.

Two days afterwards his gums began to bleed, and the blood clotted in his mouth, and the fœtor became almost unbearable. His face began to swell and the swelling increased until he could hardly open his eyes. The blood continued to ooze out from his gums for fifteen days. A day or two after he arrived at one of our mission stations.

I saw him on January 31st. He had then regained sufficient strength to walk, but he was excessively anæmic and the face swollen, gums ulcerated, and salivation still continuous. A few weeks afterwards he was sufficiently recovered to return to his trading station. He apparently has had no other symptoms.

WALTER FISHER, M.R.C.S.,

Kazmba, North-west Rhodesia,
April 7th, 1905.

TO THE EDITOR OF THE "JOURNAL OF TROPICAL MEDICINE."

SIR,—My attention has been called to a paragraph in the issue of February 1st of the JOURNAL OF TROPICAL MEDICINE, on page 44, where certain observations with regard to ankylostomiasis in Porto Rico are credited to Major Seaman. I am sure that Dr. Seaman, who is now in the Orient, would be most unwilling to take credit for the labours of others, and he has had no opportunity of doing any original work with reference to the distribution of ankylostoma in that island.

The paragraph probably refers to a report made by him for a New York daily paper of the very creditable and extensive work which has been performed in the last two or three years by Captain Baily K. Ashford, Assistant Surgeon United States Army, and Passed Assistant Surgeon W. W. King, of the United States Public Health and Marine Hospital Service. It gives me pleasure to send you by mail a copy of a recent report made by these gentlemen to the Governor of Porto Rico, entitled "Anæmia in Porto Rico."

Very respectfully,
R. M. O'REILLY,
Surgeon-General, U.S. Army.

War Department,
Office of the Surgeon-General, Washington.
June 29th, 1905.

TO THE EDITOR OF THE "JOURNAL OF TROPICAL MEDICINE."

DEAR SIR,—Having called attention, in 1903, to the favourable effects of "Cyllin" in "Mediterranean fever," I should like to state that since then others in private practice have likewise obtained good results from its use.

It has also been tried in one of the naval hospitals. In one case only was the result *nil*. In the others the duration of the fever, as compared with patients not taking cyllin, was reduced by nearly one-half. A full report will doubtless be published later.

Yours,
WILLIAM HARTIGAN, M.D., D.P.H.

London,
July 14th, 1905.

Notes and News.

SCHAUDINN'S announcement that the *Spirochæte pallida* is the germ of syphilis seems to be gaining credit. Metchnikoff, Fraenkel and Lehman and many others support the statement that the *S. pallida* is met with in the lesions of acquired and inherited syphilis and nowhere else. The *S. pallida* has not yet been cultivated.

THE estimated cost of the scientific investigation concerning plague in India for the current year is £5,000.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Government Laboratories of Manila Report," No. 20, October, 1904.

(1) Does Latent or Dormant Plague Exist where the Disease is Endemic?

M. Herzog and C. B. Hare answer this question by stating that out of 245 blood examinations of persons of whom a large percentage had certainly been greatly exposed to plague infection, in no single instance was any evidence found of the existence of plague bacilli in the blood.

(2) Report on Pinto (Paño Blanco).

P. G. Woolley states that cases of Pinto exist in the Philippine Islands. He found a coarse meshwork of branching segmented hyphæ amongst the epithelial cells. The mycelium was very fine and beaded or granular. The spores were darker in colour than the

rest of the organism and less refractile. The clear white colour of the irregular patches, the presence of sensation and itching, together with the microscopic findings, are sufficient to diagnose the condition as that of true Pinto.

(3) Framboesia; its Occurrence in Natives of the Philippine Islands.

P. G. Woolley considers that the cases of so-called lepra met with in the Philippines are probably frambœsial.

"Deutsche Medizinische Wochenschrift," June 8, 1905.

Investigations of the Coast Fever of Cattle, and Horse Sickness in Africa.

Kleine, a member of R. Koch's staff engaged in the study of cattle pests in various parts of Africa, states that the rinderpest in cattle which has been hitherto regarded as a variety of Texas fever is a distinct disease. The hæmoglobinuria and the presence of a pear-shaped parasite in the red corpuscles are due to a secondary infection in the course of a disease which Koch has termed African coast fever. In the red cells organisms are met with of either rod- or ring-shaped outline. The Texas fever parasite is present in these animals, but it only becomes virulent when the animal's powers of resistance are lowered by the illness caused by the first illness due to the coast fever parasite. All the cattle kept in infected regions which recover become immune, but the disease is fatal in from 85 to 90 per cent. of the cases. To exterminate the tick which serves as the intermediary host seems impossible, and the most feasible prophylaxis seems to be immunisation with the blood of infected animals.

Philippines.

[Extracts from the Vital Statistics of the Philippines Census of 1903. Forwarded by Isaac W. Brewer, M.D.]

The Philippine archipelago is situated entirely within the Tropics. In latitude it extends from N. 4° 40′ to N. 21° 10′, and in longtitude from E. 116° 40′ to E. 126° 34′. There are known 3,114 islands, comprising a land area of 115,026 square miles.

The inhabitants are largely Malays, that have been more or less crossed with the Chinese and the Negretos (the oldest known inhabitants of the islands). There are said to be 23,000 of the latter living in the more inaccessible parts of the mountains.

According to the census enumeration there were on March 2nd, 1903, 7,635,426 people on the islands; 6,987,688 are classed as civilised or partly civilised. There were 8,135 Americans, 6,136 other whites, and 41,035 Chinese.

The density of the population for the entire archipelago was 67 per square mile. The most densely populated province, Ilocus Sur, had 398 persons to each square mile; 65 per cent. of the Christian population (civilised natives) live on the sea coast.

The average birth-rate computed from records for the year 1876 and 1885 to 1898 was 47·9 per thousand. The average death-rate for the same period was 39·7 per thousand, but omitting the cholera years 1879, 1889 and 1890 it was 31·7.

Table of distribution of deaths from the following causes in the Philippine Islands, expressed in percentages of the total number of deaths during 1902 and 1903:—

Cause of Death.	Per cent. 1902	Per cent. 1903
Malarial fever	26·8	28·3
Tuberculosis...	6·6	7.7
Small-pox	3·4	6.2
Bubonic plague	?	0·1
Cholera	31·1	19·0
Diarrhœal diseases	3·2	7·1
Beri-beri	1·3	1·5

Cholera appeared in Manila in March, 1902, and spread rapidly over the islands, causing 31·1 per cent. of the deaths that year, and 19 per cent. of the deaths in 1903. The total number of deaths from this disease recorded in the census reports was 200,348. During the epidemic of 1879 there were about 400,000 deaths from cholera, and in 1889-1890 the mortality from the disease was about 260,000.

The following are the statistics relative to the defective classes amongst the civilised population:—

	Total.	Brown.	Mixed.	Yellow.	White.	Black.	Total per 100,000.
Insane ...	15,372	15,328	16	15	9	4	220
Blind ...	15,811	15,772	19	13	7	0	226
Deaf... ...	23,227	23,176	16	20	12	3	332
Deaf and dumb	5,910	5,907	3	0	0	0	85

The cases of insanity developed during 1902 amongst the soldiers serving in the Philippine Islands amounted to 114.

"Indian Public Health," June, 1905.

(1) How Plague Originates in Cities in India.

Captain E. F. Gordon Tucker, I.M.S., in an article entitled "The Management of a Plague Epidemic and the Principles on which it should be Based," gives an interesting account of how plague seems to originate in a city independently from infection from without.

A family comes from an infected area in good health, and settles down to live in the house and with the family of a friend A. As the family has come from an epidemic in another town in which the pestilence has passed its maximum, any case occurring in the infected family in its new quarters is not likely to be of the fulminant type. One member, X., develops symptoms of fever, with vomiting and diarrhœa, and has in a day or two a bubo which suppurates under native remedies, bursts, discharges, and finally heals up. The convalescent departs with his family to his former place, and nothing more is heard of him. When A.'s house has become infected a friend B. comes from a distant quarter of the town, sits for some hours in the infected house, knowing nothing of its condition, and departs for his own with the virus in his system. As he is an early indigenous case his illness is *likely* to be fulminant and atypical. Next day he develops high fever and delirium and dies in a few hours. This is a clear case of death from "fever," and any one suggesting it to be one of plague is considered a nuisance and a fool. C. comes to the house and sits by the corpse, and finally attends the funeral. Some days afterwards C. develops high fever and a severe cough. He coughs up with difficulty a considerable amount of expectoration, which his relatives wipe away from his mouth with his clothes. On the third day he dies, and has evidently succumbed to "pneumonia." D. lives in a house built back-to-back with that of B.,

but in a totally different street. He did not know B., even by sight, and probably does not know that B. is dead. Six days or so after the burial of B., D. finds that one of his children is ill with fever, and a tender lump in the neck; the same night D.'s wife dies, after vomiting incessantly for an hour.

Ten day's after C.'s burial, some people living in a house lower down the road get ill; the neighbours hear a baby crying and, going in, find a woman with high fever and a large bubo in one groin, and almost insensible, and the husband lying dead, with his face in a pool of blood.

So that the surroundings of B. and C. have become infected, the stage of *local place infection* has started, and all this is due to X., whose existence no one knows of, and through the intermediaries B. and C. whom no one suspects to have died of plague, that is to say, that the stage of *sporadic atypical cases* has been missed.

(2) The Commissioner of Plague, Rangoon, circulates the following precautions against plague: (*a*) Do not sleep on the bare ground at night, but on a bed, or charpoy, or box. (*b*) Do not touch a dead rat with the hands, or eat grain in which dead rats have been found. (*c*) Throw outside the dwelling all waste which rats will eat or on which flies will settle. (*d*) Kill all the rats and mice in your house. (*e*) Avoid the breath and do not touch the face of a person dying or dead from plague. (*f*) Do not shut up sleeping rooms at night, but allow plenty of fresh air to come in. (*g*) Wash all clothing and bedding and dry them in sun every week. (*h*) Do not believe the lies which are circulated by ignorant people, saying that patients are given medicine and then die quickly. No patient is sent to either of the plague hospitals without the order of a qualified doctor. (*i*) Patients may be kept in their own houses, if there is an empty room in which to nurse them. (*k*) A lady doctor attends purdah nashin women.

Standard Chemical Disinfectants. By Wolf Defries, B.A.

Mr. Defries has written a valuable pamphlet describing a method of supplying disinfectants, under which their specific disinfectant values may be defined and compared in relation to their price. In 1896, Mr. C. G. Moor suggested examining some standard disinfectant as a control on the investigation of any new substance. In 1903, Dr. Rideal and Mr. Ainslie Walker suggested that the ratio of the strengths in which a disinfectant would sterilise a given organism, to that of the strength of carbolic acid which would effect the same sterilisation, could with advantage be adopted as a practical measure of the efficiency of a disinfectant. This plan of standardisation has been adopted and constitutes, at present, the method by which disinfectants are controlled or assayed. The value of a disinfectant is really its germicidal efficiency, and on that basis alone is it expedient to determine its practical utility.

Of disinfectants recently introduced, cyllin, a preparation introduced by Jeyes Sanitary Compound Company, holds the most prominent place. Cyllin remains permanently homogenous, and has a bactericidal efficiency of at least eleven times that of pure carbolic acid. Fraenkel states that "the disinfectant action of cyllin excels very considerably that of all other chemical substances with which it is compared." Klein tested the power of cyllin on the tubercle bacillus, and ascertained that it was the best practicable method of destroying such tubercular bacilli as might be found on the floor of public-houses, railway carriages, and other public places. Professors Simpson and Hewlett found cyllin in its effect on the plague bacillus to be thirty-four times stronger than carbolic acid.

Jeyes Company have prepared a liquid cyllin soap disinfectant, a hard and soft soap, with 10 and 5 per cent. cyllin respectively, and a triple-milled soap for surgical purposes, prepared also with 10 per cent. cyllin. As a disinfectant for sewers and drains and for road watering, cyllin is at once cheap and effective.

Medical preparations of cyllin consist of palatinoids (1 and 3 minims) and an emulsified cyllin disinfectant.

For the disinfection of the skin, after scarlet fever, &c., a preparation termed lano-cyllin is handy. A cyllin inhalant, concerning which Dr. Klein has reported favourably as to its potency, is supplied for use in pulmonary disease.

Geographical Distribution of Disease.

As information arrives we publish, under this heading, the principal diseases met with in tropical and sub-tropical countries, so that those interested in the Geographical Distribution of disease may have a means of gathering information concerning the prevalent ailments in different parts of the world.

Panama.

YELLOW FEVER.

During the week ending June 12th, 4 fresh cases of yellow fever occurred at Colon and Panama. Deaths from the disease: Colon, 4; Panama, 2.

Sei-I-Kwai, vol. xxiv., No. 1.

An endemic disease in Japan, due to a special parasite, has been discovered and described by Katsurada. The eggs of a trematode have been found in the liver and stools. Although undescribed and unnoticed previously, Katsurada finds that in the district of which he writes the disease has been known for a long time, and every year from 1899 to 1903 between 30 and 54 cases occurred. The mortality was small, the deaths three to five yearly, but the persons attacked were rendered feeble and incapable of work. Children are frequently attacked. Diarrhœa ushers in the complaint; anæmia and ascites supervene. The abdomen assumes a characteristic shape, being flat or hollow below the umbilicus, but distended above. The distension obtains even when the liver and spleen are not markedly enlarged. The parent female parasite and some ova have been found in the branches of the portal vein. Katsurada believes that there is a distinct connection between working in the wet rice-fields and the disease. When wading in the rice-

fields it is found that the skin becomes covered by an eruption which itches severely, and the parasite is presumed to enter by the skin thus irritated. In districts where artesian well-water is used, and where wading in the bubble-covered water of the ricefields is prevented, the disease becomes less frequent.

Plague.

India.—During the week ending June 10th, the deaths numbered 7,486, of which 5,086 occurred in the Punjab.

South Africa.—During the weeks ending June 10th and 17th, fresh cases numbered 3 and 1 (*East London*, 3; *King William's Town*, 1); deaths, 2 and 1.

Mauritius.—During the weeks ending June 23rd, 29th, and July 6th: Fresh cases, 3, 2, 1; deaths, 2, 2, and 1.

Hong Kong.—During the weeks ending June 24th and July 1st and 8th: fresh cases, 16, 25, and 21.

Australia.—During the weeks ending May 27th and June 3rd: fresh cases, 0 and 2 (1 at Ipswich and 1 at Brisbane during the latter week.)

Leprosy.—Currasquilla, of Bogota, considers that leprosy is not contagious, but that it is infectious and that the infection is conveyed by vermin. Cleanliness of body and habitation and protection against vermin is the proper prophylaxis.

COLONIAL CIVIL SERVICE.

Mr. J. E. Green, B.A., LL.B., who was recently appointed Solicitor-General of Southern Nigeria, has assumed the duties of his office, and is officiating as Attorney-General, and Mr. R. T. Orpen, the Police Magistrate, is acting as a Puisne Judge.

The Hon. C. Riby Williams, C.M.G., Treasurer of the Gold Coast Colony, who has been acting as Colonial Secretary for some time past, has arrived in England on leave.

Mr. E. E. Colman, who has been acting as Fourth Magistrate at Singapore, has been appointed Third Magistrate in place of Mr. O. B. Robinson, who has been transferred to the Post Office Department.

Mr. Howell Pickwoad, of the Treasury and Customs Department of British Honduras, has been selected for the office of Assistant Treasurer of the British East Africa Protectorate with headquarters at Mombasa.

Mr. Walter D. Bingle, Chief Clerk in the Home Department of the Commonwealth of Australia, has been selected for the office of Chief Electoral Officer for the federated States.

Chief Justice H. G. Kelly, of Southern Nigeria, has arrived in England on leave.

Mr. James Van Langenberg takes over the duties of Solicitor-General of Ceylon in place of Mr. Ramanathan, K.C., C.M.G., who goes upon twelve months' leave prior to retiring from the public service. On his return to the Colony Mr. Ramanathan will devote his attention to the higher education of the Cingalese.

Mr. Cyril C. Pyke, District Officer of Labuk and Sugut, British North Borneo, has resigned his appointment in the public service of that Colony.

Mr. G. C. Woolley takes over the office of District Officer of Jesselton, British North Borneo.

Mr. Rudolph D. Anstead, B.A., has assumed the duties of Agricultural Superintendent in Grenada, West Indies.

Mr. C. H. Hunter, I.S.O., Chief Assistant Colonial Secretary, of the Gold Coast Colony, is acting as Colonial Secretary, and Mr. L. W. Bristowe as Chief Assistant Colonial Secretary.

Mr. W. C. F. Robertson, Director of Education, Gold Coast Colony, becomes Acting Secretary for Native Affairs during the absence on leave of Mr. H. M. Hull, C.M.G.

Mr. L. H. J. Tinney has been confirmed in the office of Deputy Harbour Master and Sanitary Inspector of the Port of Georgetown, British Guiana.

EXCHANGES.

Annali di Medicina Navale. Annali d' Igiene Sperimentale Archiv für Schiffs u. Tropen Hygiene. Archives de Medicine Navale. Archives Russes de Pathologie, de Médec. Clinique et de Bacteriologie. Australasian Medical Gazette. Boletin de Medicina Naval. Boston Medical and Surgical Journal. Bristol Medico-Chirurgical Journal. British and Colonial Druggist. British Journal of Dermatology. British Medical Journal. Brooklyn Medical Journal. Caducée. Climate, Clinical Journal. Clinical Review. Giornale Medico del R. Esercito. Hong Kong Telegraph. Il Policlinico. Indian Medical Gazette. Indian Medical Record. Indian Public Health. Interstate Medical Journal. Jahresbericht. Janus. Journal of the Royal Army Medical Corps. Journal of Balneology and Climatology. Journal of Laryngology and Otology. Journal of the American Medical Association. La Grèce Médicale. Lancet. Liverpool Medico-Chirurgical Journal. Medical Brief. Medical Missionary Journal. Medical Record. Medical Review. Merck's Archives. New York Medical Journal. New York Post-Graduate. Pacific Medical Journal. Polyclinic. Public Health. Revista de Medicina Tropical. Revista Medica de S. Paulo. Sei-i-Kwai Medical Journal. The Hospital. The Northumberland and Durham Medical Journal. Transactions of the American Microscopical Society. Treatment. West India Committee Circular. West Africa.

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Notices to Correspondents.

1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the Journal of Tropical Medicine should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communications.

SPIRILLOSIS IN PORTUGUESE WEST AFRICA.

By A. Yale Massey, B.A., M.D., C.M.
Benguela, West Africa.

In December, 1903, was brought to the hospital a white Portuguese trader, who was in a very weak condition. Quinine intramuscularly and by the stomach in no way improved his condition. He gradually sank into a semi-comatose state, passing urine and fæces involuntarily. The temperature of 103·4° F. only dropped at death, which occurred three days later.

Blood Examination.—The fresh blood showed innumerable spirilla in a most active condition, which knocked the red blood corpuscles about in a most lively manner. These spirilla were exactly of the appearance described by Dr. Cook, of Uganda, in a case published about that time.[1]

The trading post of this man was several miles removed from any other white man, and he lived in close contact with the natives. His habits were native.

There seems to be no doubt that this disease has been often overlooked and put down to malignant malaria or even to blackwater fever, as the urine is very highly coloured (but not the characteristic hæmoglobinuric urine). I recall the case of a white trader who was stricken in this manner during a convalescence from blackwater fever. He presented the same clinical picture and the end was fatal. I feel that a more careful search of the blood would have revealed spirilla. I have also in mind two natives who died in the same way.

Etiology.—I quite agree that probably the classical relapsing fever of Russia and other countries is but one species of not a small genus of spirillum fevers.

Clinically there seems to be considerable variance, and no doubt we shall find that different species are transmitted by different carriers.

I sent to Lieut.-Colonel Giles a specimen of the commonest tick of this district biting the human body. He has very kindly had it named for me (see Journal of Tropical Medicine, December 1, 1890, page 369), and finds it to be of the species *Ornithodoros moubata*. This tick is very commonly found in the native huts, and its special prey is the human body. Dr. Wellman[2] more recently has confirmed my observations. It is found from Egypt to the Transvaal.

That the disease is not very common, considering the bites which almost every native must receive, may be explained by an acquired immunity. Or may not the disease be carried by a species of Atylotus (Tabanus) near Socius, a large fly which is very common, attacking more especially animals such as horses and cattle, and only occasionally the human species.

[1] Journal of Tropical Medicine, November, 1903.
[2] "Tick Fever," Journal of Tropical Medicine, April 1, 1905.

Suggestions.

(1) That the term spirillum fever be used for the tropical cases, instead of relapsing fever, until the (?) various spirilloses are differentiated.

(2) That careful clinical notes be taken of each case where spirilla are found in the blood.

(3) That the biting insects of the locality be catalogued.

(4) That there be in each case a careful search for trypanosomes.

THE ABORTING OF LIVER ABSCESS: A PLEA FOR EARLY PUNCTURES.

By P. N. Gerrard, M.D.(Dub.), D.T.M.H.(Cantab.), &c.
Chief District Hospital, Parit Buntar, Krian, Federated Malay States.

On April 17th a Tamil man named Sellan, aged 26, an indentured coolie on a sugar estate, was admitted to hospital suffering from "fever."

His temperature on admission was 100·4°. He complained of pain in the chest and some cough; his respiration was somewhat accelerated, and some diminution of vocal fremitus on the right side was remarked by the dresser admitting him; this was accompanied by dulness over the lower limit of the lung.

I saw him on the 18th, and found a limited pneumonic area over the lower lobe of his right lung, with enlargement and tenderness of his liver. His blood was taken, and a relative count showed an increase of polymorphonuclear leucocytes. Owing to his being in a low state, I refrained from any exploration of his liver at this time; the physical signs, however, led me to suspect the presence at least of an acute hepatic inflammation.

On the 20th, his condition not having in any way improved, I decided to "take risks," and he was anæsthetised on the afternoon of the 20th.

I made two upward and backward punctures into his liver anteriorly about the nipple line, and aspirated in both cases about 1½ drams of blood. I then proceeded back to the mid-axillary region, and in this vicinity made three punctures without "striking" anything but pure blood.

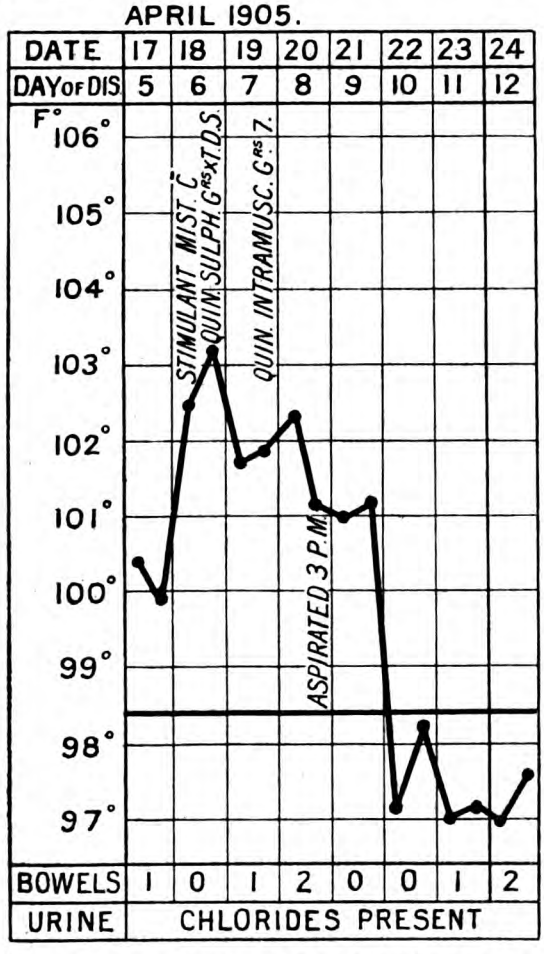
The total amount of blood extracted was approximately one ounce. As he took his anæsthetic rather badly, and my aspirator—an old instrument—was not acting satisfactorily, I refrained from further interference, and sent the patient back to bed. He recovered slowly and unsatisfactorily from the chloroform, but that evening his temperature, which had ruled over 102°, was 101°, and his general shock after operation was considerable.

On the morning of the 22nd, however, his temperature fell to 97·2°, and he eventually made an uninterrupted recovery.

Now I desire to submit two points for contemplation in this case:—

First, that, if it was a simple limited pneumonia accompanied by liver tenderness, his punctures seem to have rather improved than disimproved matters.

Secondly, and in accordance with my heading, I desire to submit that in view of the following additional history the case was one of acute inflammation, threatening abscess of the liver, with the usual basal pneumonia, which was aborted by the withdrawal of blood, and possibly a certain amount of leakage subsequently from the inflamed liver. The further history I wish to quote is: That he was emaciated; that his fever did not yield to quinine, which was exhibited intramuscularly on the 18th, and again on the 19th; his temperature did not fall, however, until three days later.



That his temperature, which was 102·5° on the day of his operation, was 97·2° within forty-one hours after puncture.

That, if it had been a case of uncomplicated pneumonia, the puncture of his *liver* and his period under chloroform would have acted rather detrimentally than curatively.

On the above grounds I submit that early puncture in cases of hepatic tenderness and enlargement, with or without a "low" pneumonia, and with a high relative polymorphonuclear count, is not only permissible, but advisable.

I trust the report of this case may lead to the publication of a series of such cases by some one more favourably situated than I am in this country.

ON SOME ADMINISTRATIVE MEASURES TAKEN AGAINST MALARIA AND CONSUMPTION IN THE TROPICS.[1]

By Sir RICHARD C. TEMPLE, Bart., C.I.E.

Late Chief Commissioner, Andaman and Nicobar Islands.

THE Andaman Islands are situated in the Bay of Bengal, between 10° 30′ and 12° 30′ North latitude, and about 92° East longitude. The penal settlement of Port Blair is about 11° 40′ North. They are therefore all thoroughly tropical.

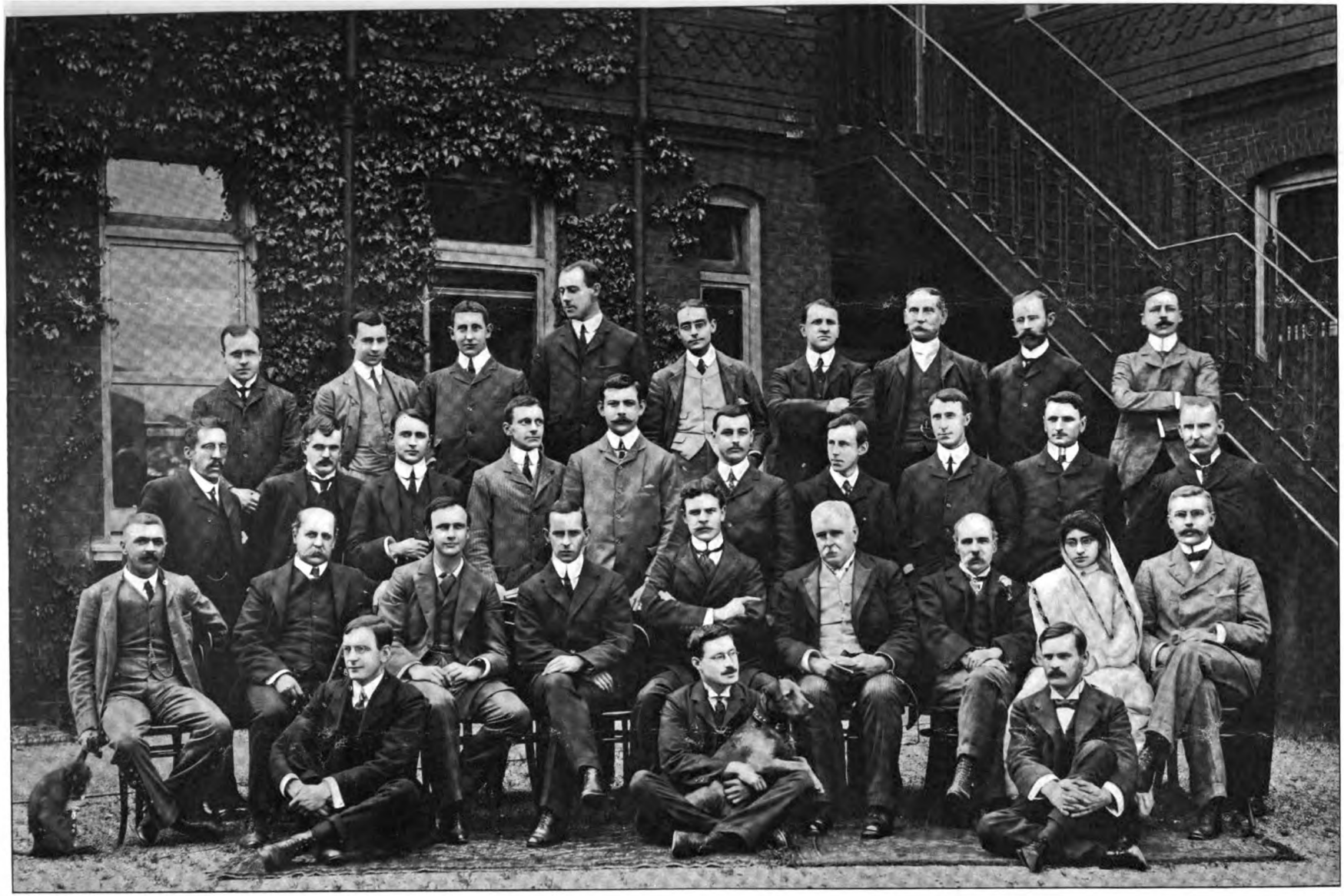
There are about 200 islands of all sizes grouped round the main islands, which are separated by straits so narrow as to make them form practically one island about 150 miles long and ten to fifteen miles wide. This is generally known as the Great Andaman. The islands are geographically the summits of a huge submarine mountain, and are therefore hilly everywhere, with highly indented coasts formed into numerous large and land-locked harbours. They are by nature covered with the densest imaginable jungle, and surrounded by mangrove swamp and coral-reef shores. Round about the southernmost of these land-locked harbours, situated in the southern island of the Great Andaman, is placed the penal settlement of Port Blair. The harbour of Port Blair is about eight miles in extreme length; it wanders about a good deal, and varies in width from one to two miles.

The inhabitants of the penal settlement occupy three small islands in the harbour, named Ross, Chatham and Viper, and all the country round about up to about 300 square miles. The three islands are well cleared, but the country round the harbour consists of every variety of land, from absolutely cleared and cultivated areas to natural forest. It is chiefly made up of hills and long, narrow valleys. The hills run up to about 1,500 feet, and the valleys are not usually more than half a mile wide.

The rainfall varies much in various parts and from year to year, but may be taken at 130 inches per annum, though in parts of the penal settlement the fall reaches to 200 inches in most years. Port Blair is exposed to both the south-west and north-east monsoons, and so the rainfall is well distributed over the year, but it is generally heaviest from May to September. Violent winds and storms are frequent. Continuous dry weather occurs, and then the heat becomes great. The average annual temperature is about 82° F., the diurnal variation is about 10°, and the annual average variation is about 21°. The crops chiefly cultivated are rice, pulse, maize, sugar-cane, and turmeric, and there are very large gardens for vegetables. The conditions make the settlement a natural home for the mosquito in common with all islands and countries similarly situated. Malaria is by very much the most prevalent disease.

The population consists of the convicts sent by the Government of India from every part of the Indian Empire and their descendants, official establishments, and a few traders and their families. It may for the present purpose be thus shown (Census of 1901):—

[1] Delivered at the Sanitary Congress, Glasgow, 1904.



Top Row: A. T. Stanton (Sen. House Surgeon). D. Mackinnon, W. D. Inness, E. V. Croker, W. L. M. Goldie, G. B. Warren (Laboratory Assistant). Lt.-Col. C. H. Bennett, I.M.S., Surgeon E. R. Stitt, U.S.Navy, E. G. H. Weir (House Surgeon).

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4th Row: J. S. Smith, K. S. Wise (Demonstrator). J. T. C. Johnson.

THE LONDON SCHOOL OF TROPICAL MEDICINE.

18th Session. May - July, 1905.

Bale, Sons and Danielsson, London.

	Males.	Females.	Total.
Convicts	11,217	730	11,947
Official establishments	1,168	...	1,168
Adult free residents, including convicts' descendants and ex-convicts	850	747	1,597
Children	773	621	1,394
	14,008	2,098	16,106

Of this population 351 are Europeans and Eurasians, and the rest are composed of every race in the whole Indian Empire from Afghanistan to Burma, from Kashmir to Madras.

The population is scattered all over the settlement in what are called technically stations and villages; a station is a place where numbers of labouring convicts are kept in jails or barracks; a village is a place where the free population or the self-supporters (ticket-of-leave convicts) live in private houses. The free and convict villages are separated into two districts, between which there is only a limited intercourse permitted. The stations are scattered over both districts at any spot where convict labour is required. The situation of stations or villages is primarily regulated by economic or administrative requirements—on hills or in valleys, on the sea-shore or inland, on cleared or forest land or in the jungle. Subject to this over-ruling necessity the medical authorities have a voice in the choice of site. There are twenty-nine stations and thirty-four villages.

The administration of the settlement is of necessity autocratic, as all the convicts and all the Government establishments have to be held under the strictest discipline, and all free residents and their dependants have to conform to rules relating to dealings with the convicts.

I was for ten years (1894-1904) the Chief Commissioner of the Andaman and Nicobar Islands and Superintendent of the penal settlement of Port Blair for the Government of India, and during the last years of my administration a serious effort was made, in accordance with the wishes of that Government, to take administrative steps towards the prevention of malaria. Statistics of late years also showed that consumption, phthisis with tuberculosis, was getting a hold on the settlement, and was likely to spread. Serious efforts were, therefore, also made to prevent this, too, as an insidious, infectious disease liable to spread unless checked.

There are many considerations in dealing with the convict sick- and death-rates that do not arise in ordinary life. The conditions are always highly artificial, as there is one constant struggle between efficiency in discipline and labour and the maintenance of a low sick- and death-rate by regulation and direct measures. The tendency on the one side is to overstrain in the direction of penality and economy; on the other side to secure "satisfactory" health statistics at the cost of over-leniency and extravagance. This fact must always be borne in mind in reading convict statistics. "Bad" years are apt to bring about strict sanitary and medical measures, "good" years to bring about relaxation of irksome regulations. This may partly account for an observation on statistics for thirty years that the mortality rates at Port Blair appear to rise and fall in cycles, as may be seen from the following abstract:—

	Period.	Years.	Death-rate.	Average Death-rate per Mille.
(1)	4 years	1871 to 1874 ...	Low ..	18·46
(2)	7 ,,	1875 to 1881 ...	High ...	49·07
(3)	6 ,,	1882 to 1887 ...	Low ...	22·02
(4)	5 ,,	1888 to 1892 ...	High ...	41·37
(5)	6 ,,	1893 to 1898 ...	Low ...	28·39
(6)	2 ,,	1899 to 1900 ...	High ...	41·25

The first group is probably the end and the last the beginning of a cycle, 1901 and 1902 being also "high" years. Thirty years of Port Blair showed also that the annual rainfall does not there bear any real relation to either sick- or death-rate, and that the death-rate bears some, though far from a continuous, relation to the sick-rate annually. Monthly rainfall has a decided effect on the sick-rate, which greatly rises regularly every year during the heaviest rains (July to September).

Again, statistics showed that acclimatisation has much to do with annual sick- and death-rates in the penal settlement, and it has been found that the highest rates are among the latest arrivals, and that the convicts of five years' residence and under are those that fill the sick and death tables.

With these general facts in view, very careful statistics were collected on fixed days during a "bad" week of 1902, viz., June 25th and 28th and July 2nd, of the men actually sick among the convicts, with a view to ascertaining facts regarding the convict sickness, on which to base measures for controlling it.

As regards the prevalent diseases, the following are the general figures for these three days, which approximate, as a matter of fact, the figures usually returned annually:—

Disease.	Percentage of Prevalence among the Sick.
Malarial fever (47 per cent.) and dysentery consequent thereon (7 per cent.)	54
Ulcers and injuries	16
Phthisis and tuberculosis	6
All other diseases including dysentery other than malarial (7 per cent.)	24
Total	100

Ulcers and injuries are classed together, as they are both ordinarily induced in the convicts by outdoor work, and are largely due to their innate personal carelessness, and so beyond the control of the authorities.

These statistics seem to place it beyond doubt that these three—malaria, dysentery, and phthisis—are the main points requiring special attention, and also that if malaria alone can be successfully checked in growth, the health of the penal settlement will put on a new aspect.

I have endeavoured briefly to explain the condition of the problem before me as Administrator, and I will now explain the steps taken and some of the difficulties that arose. But first I would like to draw attention to an old report I came across on the health of the penal settlement, made by Dr. W. H. Rean, Senior Medical Officer, in 1867, which is most instructive in the present day. Among other matters of great interest to the existing administration he

drew up two diagrams, which, in the light of existing theories and efforts, are more than instructive. These diagrams show the prevalence of fever at the time with reference to other diseases; one relates generally to the whole settlement, when the enormous preponderance of fevers then became clear, and the other to Viper Island only, where there is a decided preponderance of other diseases over fevers. Dr. Rean attributed this to the early clearing of the island and the consequent absence of miasma, where nowadays we should say it was due to the clean condition of a hilly island which prevented mosquitoes from breeding.

Working on the basis that the Government of India had accepted the theory of the connection of the mosquitoes and malaria, and that it was therefore the duty of all Government officials to assist in taking such steps as were necessary and practicable locally to reduce the mosquitoes in the penal settlement, experiments were undertaken on a small scale under the direction of the Senior Medical Officer. The result seemed to show that the following simple, effective and inexpensive steps to reduce the mosquitoes and the evils they bring with them were practicable in the neighbourhood of convict barracks, in stations and on islands, without much difficulty: (1) Lime-washing water-barrels kept up for building purposes or for fire protection, and throwing in occasional handfuls of quicklime into such as do not contain drinking water; (2) covering the barrels; (3) filling up puddles and pools; (4) clearing away rubbish; (5) tidying up generally. It was also found not to be difficult wherever convicts were congregated to take care of the spaces under barracks and buildings by (1) white-washing, (2) sweeping, (3) clearing rubbish, (4) fumigating.

An enquiry was therefore set on foot in 1902 as to the establishment to be created from among the invalids, light-labour men and other available convicts at every station in the settlement, and as to the steps that could be actually taken on the above lines. This enquiry led to the issue of the following formal orders on the subject on November 27th, 1902.

Settlement Order.

(1) All investigation shows that the chief cause of sickness and mortality in Port Blair is malaria, to some extent a preventible disease, and that if malaria can be eliminated or at any rate largely reduced, there is nothing to fear at present from any other causes of sickness and mortality in the Penal Settlement. A serious effort will, therefore, be now made to destroy, as far as possible, the cause of malaria, *i.e.*, the Anopheles mosquito; but as it requires special training and knowledge to distinguish this mosquito from others such as it is not practicable to induce in convicts, the attempt will be made to destroy all mosquitoes.

(2) For this reason a large brigade will be formed from December 15th next as under at all stations to work as an experiment.

(3) The Mosquito Brigade will consist of the petty officers, labouring convicts and carts in the list attached, and also of as many convalescents and invalids in addition as may be available and found to be necessary.

(4) The district officers will at once choose intelligent petty officers and labouring convicts for this duty, so as to be ready for work on Monday, December 15th next.

(5) The duties will be in two classes:—

A.—Heavy Work.

Filling up puddles and hollows and borrow pits, improving (clearing and levelling), draining, clearing rubbish, clearing jungle and undergrowth for 100 yards round buildings.

B.—Light Work.

White and lime-washing, sweeping and tidying up.

(6) The instruction and supervision of the brigades will be under sub-divisional officers, overseers and sub-overseers. The brigade should be shown how to find mosquitoes and be provided with scoops (old *talis* or native fry-pans with handles) and the necessary *patus* or native hoes and such implements, and should be set on their task daily until it is done thoroughly. Each place should be gone over and over again until really cleaned up and all pieces of rubbish, such as pots and pans, tins, pottery, cocoanut shells, &c., are removed.

(7) Each member of the brigade will, while on this duty, wear a red band round his right sleeve as a badge to let all know his work.

(8) Further information is to be had from Ross's "Mosquito Brigades," now in the hands of the district officers.

Strength of the Brigades (Abstract).

	Petty Officers.		Able-bodied Labouring Convicts.	Carts.
Northern districts ...	18	...	81	6
Southern districts ...	9	...	48	4
Total	27	...	129	10

At the same time free residents were requested to assist in the following terms:—

Malaria is the only disease that need be feared in Port Blair and an effort is now being made to attack the cause of it, the mosquito. A mosquito brigade, men with red bands on the right arm, is being organised, whose duty is to clear away all rubbish (pots, pans, tins, pottery, empty bottles, cocoanut shells, &c.) from compounds and the neighbourhood of houses; and also to pay attention to water-barrels and generally to clear up. In this way mosquito breeding places can be gradually destroyed. It is in the destruction of these breeding places that the chance of reducing malaria is to be found. Every resident is therefore requested on his own account and on account of his neighbours to help the efforts of the brigades.

It will be seen that the gist of the orders and circulars issued amounts to a general clearing up and keeping clean, so the work of the brigades would have a general sanitary value, apart from the special object of stamping out the mosquito; but the orders did not cover the villages, of which there are thirty-four, as

these required a totally different organisation. An energetic officer having on his own account started an experiment in the convict villages, an order was issued on December 19th, 1902, to the following effect :—

The following arrangements, already partially in practice in the southern district, will be adopted in all self-supporter (ticket-of-leave) villages: (1) Every village will be divided into wards (*pattis*) according to size of about twelve houses each ; (2) in each village will be formed a mosquito brigade (*machharwalas*) consisting of one resident in each ward chosen by the sub-divisional officer ; (3) each member (*machharwala*) of the village brigade will be in charge of the ward in which he is resident ; (4) the heads of the village brigade and responsible for its working will be the chaudhri (headman) and the chaukidar (watchman) ; (5) sub-divisional officers will keep a list of all the members of the village brigades and no change may be made among them without their knowledge or permission—all changes will be entered in their lists ; (6) every *machharwala* is excused from village parades (a great privilege) ; (7) the duties of a village brigade are as follows : (*a*) every *machharwala* will go through his ward daily ; (*b*) he will drain or fill up all puddles, and see that no stagnant water lies about ; (*c*) he will remove all weeds and rubbish ; (*d*) he will collect all old tins, broken pots, broken tiles, cocoanut shells and rubbish of that kind, and put them on the rubbish-heap ; (*e*) he will see the fire-pots frequently refilled, that no pots of water are left about and forgotten, that each villager cleans up his surroundings and takes all cowdung, &c., to the refuse pit ; (*f*) he will keep tanks and large pools in his ward, or outside the village near it, clear of grass and weeds near the edges ; (*g*) he will report all obstruction or negligence of villagers to the chaudhri at once ; (8) sub-divisional officers will choose steady men for this work, who are not ordinarily fit for the heavy work of a village parade ; (9) sub-divisional officers will also see that two village parades are devoted to this work at once and that in future one parade every two months is devoted to it ; (10) sub-divisional officers and overseers on their rounds can at once perceive if a village brigade is doing its work by the appearance of the village—for a dirty village the chaudhri and chaukidar should be punished, for an exceptionally and creditably clean village their names may be submitted to the superintendent ; (11) sub-divisional officers and overseers should take every opportunity of showing village brigades how to work, and for this purpose they should apply for vernacular copies of this order, which will be issued on application.

It is interesting to note that these steps would precisely bring about the very conditions that unconsciously brought the fever rate on Viper Island below that of other diseases in 1867, according to Dr. Rean's report above quoted.

It takes a long while to rightly judge of the effects of such orders as those above quoted in such a place as Port Blair, as that depends, firstly, on their systematic and continuous intelligent application ; and secondly, the fever cases actually occurring at any given time include those of new arrivals infected elsewhere, and of recurrence of fever in men not necessarily infected in Port Blair, as great numbers, in fact the majority, of the convicts have been inhabitants of fever-infected localities. So I am not in a position to say what the effects of the administrative steps taken have, so far, actually proved to be, as I left the Settlement in May, 1903, on furlough, and resigned my appointment in the ordinary course in January, 1904. I can merely point to them as an experiment on a large scale made under exceptional opportunities of testing the value of the mosquito theory. I can, however, say that on Viper Island, a large convict station, under very strict discipline, where previously no Europeans slept without mosquito curtains, officials told me that they had begun to discard them with immunity.

In addition to the steps above explained, opportunity was taken in 1902 of the establishment of convict ambulance and first-aid classes on the lines of the St. John Ambulance Association, to spread among the convicts a knowledge of malaria and tuberculosis, and of simple practical methods of combating them, on the ground that one of the most important considerations from every practical point of view in regard to the management of convicts is the maintenance of their health, and that the chief difficulty in relation to this matter is the neglect of it by the convicts themselves, arising out of their complete ignorance of the steps necessary to maintain it. Every step taken by the authorities towards the improvement of sanitation, towards the ensuring of personal cleanliness and intelligent care of the body, towards wholesome cooking and water, and eating and drinking in a wholesome manner, towards the prevention of disease, especially of malaria, the commonest and most injurious in its results on material progress of all the local diseases, or towards the proper treatment and handling of the sick and injured, met with a stolid, impassive and never-ending resistance on the part of the convicts and every possible kind of evasion. So that all steps taken were rendered nugatory to an extent that had a palpable effect on the health returns and the concrete results of convict labour. This tacit opposition on the part of the convicts was the result of ignorance, and as it was not practicable in the penal settlement, with its 327 square miles of area spread over and worked by convicts, to employ that force and supervision in this matter possible in a prison, the importance of education in matters of health became obvious.

At the ambulance classes every man was taught elementary sanitation, the main facts concerning tuberculosis and malaria, together with the precautions to be taken against them and the importance of the careful, cleanly cooking of food and the boiling of water. The convicts for the ambulance classes were, of course, carefully selected for intelligence, character and so on, but still the conduct of the classes proved a matter of great difficulty, and it was only the steady, persevering work of the instructors, all medical officials of the Settlement, that made them a success. In the result I was quite surprised at the knowledge acquired and the interest taken by the convicts in this sort of work. One of my last public acts was to preside at an exhibition of ambulance work by the convicts, and I was much impressed, on going amongst the pupils and questioning them personally, at receiving voluble

lectures in the native vernacular on domestic sanitation, mosquitoes and malaria, microbes and tuberculosis, delivered with great pride and intelligence.

Among the steps taken against malaria was the entire covering in of the inside of a portion of a barrack in the female gaol with a mosquito net and selecting women to sleep in it at night. For some reason malaria had been specially rampant among the inmates of this gaol of late years. The experiment was not at all conclusive in its results during my time, and I did not feel inclined to practise with it on a large scale on account of a difficulty that arose. Irrespective of this, the curtains to be effective exclude the air in excluding the mosquitoes, and the women did not like this, as it made the barrack air close, a serious matter in the Tropics.

This brings me to state briefly what was done as to the prevention of consumption and the effects of the steps taken to combat that disease on those taken against malaria.

In the first place, an effort was made to make the likely sufferers, *i.e.*, the convicts, understand what consumption was, how it was spread and how it could be best met, and then every step possible was taken to attract the attention of all to the following information, which was circulated broadcast in the chief vernaculars and explained verbally at every opportunity.

NOTE ON CONSUMPTION FOR CONVICTS.

(1) Consumption (phthisis and tuberculosis) is a very fatal catching disease caused by a microbe. It causes sixty to eighty deaths every year in Port Blair. (2) The microbe is present in large numbers in the lungs of persons suffering from consumption and is coughed up with the sputum. (3) When this sputum (stuff coughed up by the lungs) dries, the microbes are apt to be blown about with the dust, and either to be breathed into the lungs or to get into food-stuffs, especially milk. In this way the disease is spread. (4) Though the disease is caused by this microbe, it is favoured by dirt, darkness, moisture and overcrowding. The greatest foes to consumption are sunshine, dryness and fresh air, combined with care about food and milk. (5) To check consumption it is important to (*a*) ensure as much sunshine and fresh air as possible; (*b*) see that all men suffering from coughs, loss of weight and night-sweats be sent to hospital in order that they may be carefully examined and if necessary treated—consumption in its early stages can be cured; (*c*) discourage the habit of spitting indiscriminately about barracks, yards and cells, particular attention should be paid to this; (*d*) when a man is sent to hospital for consumption, his spare kit should be boiled and the sleeping place he has been accustomed to occupy in the barrack should be thoroughly cleaned and disinfected.

In the next place, a special separate consumptive hospital was erected, and then a difficulty arose. Free perflation of air in dwellings is an essential in combating consumption; curtains and netting are to many minds an essential in combating malaria. What is to be done when both are present as diseases to be seriously fought against in the same place? The subject was long and elaborately discussed officially at Port Blair, and when I left it was before the Government of India for decision. My own advice on the subject, as the result of the discussion and in regard to the special locality under consideration, may, without committing any official indiscretion, be summed up as follows, given, of course, with reference to local financial capacities.

Phthisis as a slow infectious disease must be dangerous in an island community like that of Port Blair, and it is undoubtedly spreading among the convicts. The main cause does not lie in the supply of food, but apparently in the insufficient lateral sleeping floor area in the barracks. A practical remedy at a reasonable cost appears to lie in the construction of special additional barracks for invalids and convalescents with a special allowance of floor area. This will of itself admit of a general increase in lateral floor area in sleeping accommodation throughout the settlement. A contributory cause is wet or damp clothing during the excessive rains in the settlement. The cheapest remedy lies in the supply of additional clothing. The proper prophylactic appears to be early detection of the disease, involving systematic frequent medical inspection and periodical weighment of convicts. A small increase in the subordinate executive and medical staffs will effect both objects to a profitable extent.

Malaria is the chief disease of the settlement, and its prevention or reduction is a matter of first importance to the general welfare. The practical remedies appear to be the establishment of mosquito brigades, which are of great general sanitary value, irrespective of their usefulness as regards malaria; the establishment of branch dispensaries at out-stations; the issue of more clothing to the convicts; the general administration of quinine as a prophylactic. The mosquito net is impracticable for reasons given below. The only expenditure beyond that required for phthisis necessary here is for the quinine prophylactic.

The local dysentery is much mixed up with malaria, and is not attributable to the water supply, but to infection, and in some degree to exposure while at work. The exposure is unavoidable, and need not be considered in devising remedies. The local dysentery is, in fact, "institution dysentery," for which the practical remedy appears to be segregation on detection. This need not involve Government in additional expenditure.

The special point to be always borne in mind in considering measures to prevent the spread of the three dangerous diseases in Port Blair—malaria, dysentery, and phthisis—is that to prevent the insidious infection of phthisis there must be the freest perflation of air possible in dwellings. This prohibits the mosquito net as a remedy for malaria in Port Blair convict barracks. As both phthisis and malaria are equally dangerous in the settlement, the choice must be made between free perflation of air and the mosquito net, and, since the mosquito brigade is a good remedy for malaria, the mosquito net must be left out of consideration.

This opinion has since been subjected to the official mill of the Government of India, and, no doubt, also to those of other and conflicting advisers, and what action has been taken on it I do not know. But it

seems to me that the following points of general interest result from the above remarks and observations :—

(1) Malaria is an overwhelming cause of incapacity for work and of death in the Tropics.

(2) A place like the penal settlement of Port Blair affords exceptional opportunities for experimental administrative measures for combating it.

(3) The presence of malaria and consumption in the same locality as dominating dangerous diseases (the usual dangerous Oriental epidemics like cholera typhoid, plague, small-pox, beri-beri, are absent from the penal settlement) presents a difficulty in dealing effectively with malaria on existing theories and practice which requires full consideration.

EQUIPMENT AND HYGIENE ON "SHOOTING TRIPS."

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Among the many articles which are written from time to time on the subject of kit, equipment, and hygiene for travellers and sportsmen in Africa I have not yet noticed one dealing with that prolific source of ailments, namely, the "shooting trip." By this term I define a short expedition (lasting anything from two days to a fortnight) in pursuit of game made from one's main camp as a base, or, in the case of a resident in such a country, from one's station. During two dry seasons and part of a wet one, of constant travel in Northern and Southern Rhodesia, Portuguese Zambesia, and to a less extent in British Central Africa, I have observed that men who, while out on their stations or when touring on duty or business, take all hygienic precautions, yet, when away for a week's shooting, consider it necessary to discard pretty well everything not indispensable to existence. Certainly in Northern Rhodesia, which, taking it as a whole, is a healthy country, most men's malarial fever and much of their dysentery originates in one of these "shoots." I am aware that many men take, and most books recommend, an outfit compared to which that detailed below is a mere fraction, but I am inclined to the opinion that in many cases there is a certain relation (an inverse ratio) between the size of the "bag" and the bulk of the kit. In view of recent scientific knowledge, however, precautions as to protection from mosquitoes, filtration of water, &c., cannot be disregarded, and it is the idea of showing how these may be introduced into the most mobile equipment (mine consists of three loads) that has prompted this article.

The one desideratum in the following of large game is mobility. Loads must be under 30 lbs. in weight, and with such a good carrier has no difficulty in following a European almost at the latter's pace through any sort of country. Of carriers there must be an abundance, but they are wanted to carry game, not personal equipment, and the following articles constitute what I consider an irreducible minimum for the dry season, and even when there is a chance of light, occasional showers :—

(1) One small load of food, mostly biscuits and flour, tea or coffee, cocoa, condiments, spirits, candles, and a lamp.

(2) A kit-bag containing changes of clothes, boots or shoes, carbolic soap, and sponge.

(3) Two or more blankets and a pillow slip.

(4) Small Berkefeld filter, one spare candle and at least four canvas water-bottles. A couple of light cooking-pots, frying-pan, kettle, and a canvas bucket and basin.

(5) A large mosquito net, } to be detailed
(6) A single-pole machilla with cover, } later.

(7) The following dressings and drugs :—

Quininine bihydrochloride tabloids, grs. v.

An efficient cholagogue and carthartic, as calomel and colocynth compound.

A tabloid equivalent of tinct. camph. co. (opium and camphor).

Tabloid biniodide of mercury (for wounds).

Clinical thermometer, two or three rolls of cyanide gauze put up in sterilised packets, a bandage or two, and some lint and stout plaster, to be used in treating "boys."

(8) A hypodermic syringe in metal case containing tab. morphia, gr. ¼, strychnine, cocaine, and apomorphine. This last, with a tin of Brand's beef essence, should be carried in one's cartridge-bag, when its total weight is equivalent to three ·450 cartridges.

For lay information I may state that the articles enumerated under (7) can be carried in the pocket of a gun-case, if one is taken, or if made up separately from a package 6 in. × 4 in. × 2 in., and weigh less than 1½ lbs., and they can be obtained from any reliable firm, as Parke, Davis and Co., or Burroughs Wellcome and Co., and from the former by mentioning this paper.

All articles specified under headings (1) to (7) can, if desired, be carried by three men, everything except food and cooking-pots being put into the machilla, which is, when thus loaded, a light burden for two men out of the three.

Food.—Little need be said as to what is actually taken, as everything depends on individual tastes. The inventory should, however, contain some form of fruit, and I can recommend the dried apples sold by the Army and Navy Stores as being light to carry and most palatable. As regards wines and spirits, none of the former and little of the latter is the best rule. Alcohol in any form during the day spoils one's shooting, and is distinctly inferior to tea as a pick-me-up; but when dead tired after a long day in the hot sun, it is distinctly serviceable even as an appetiser. These goods should be carried in a light wooden box, preferably of "venista" construction.

There is a great divergence of opinion among sportsmen as to how meals should be arranged. For most game the best shooting time is just about sunrise, and if there is any distance to be traversed, a very early start may have to be made. Again, it is a common occurrence to have to keep going in the hot sun until eleven or twelve o'clock without a halt, and on some occasions nearly all day. In view of this possible contingency, I am of opinion that a breakfast consisting merely of a cup of coffee and a biscuit taken before daylight is a great mistake, even when considered

from the sportsman's point of view, apart from its effect on the body. It is impossible to expect good shooting of a man who has been walking in the hot sun for four or five hours, and whose last square meal was taken probably over sixteen hours before. The man who gets up half an hour earlier and has a breakfast including porridge and meat, uncomfortable though it may be in the dark on a cold morning, has the best chance after ten o'clock, and can go on all day without anything more if need be. In addition, the heavy breakfast saves the trouble of providing a large lunch, which in itself is undesirable, as it conduces to laziness in the afternoon. As an emergency ration I carry Brand's beef essence in my haversack or cartridge-bag, but cocoa and biscuit make an excellent substitute, only Brand's requires no utensil to cook and serve in. Chocolate is certainly good as a material to chew while walking. I have not tried kola nut.

Prolonged exertion in a high temperature without food is in many people provocative of considerable gastric irritability. The unfortunate subject arrives in camp exhausted, and, even if not actually vomiting, has no appetite. A cup of hot tea, whisky, or bovril will usually meet the case; but if these are ejected, or if the irritability remains, a half teaspoonful of baking powder in a cup of hot water should be sipped, and a hot foment or mustard applied to the epigastrium. Some soup may be tried about half an hour afterwards; but, in any case, quinine 10 to 20 grs. should be taken that night, as these may be the premonitory symptoms of an attack of malarial fever.

Clothing.—Let that be simple and of the oldest. Loose drill khaki trousers and a very thick flannel shirt is the best combination for most sorts of bush, also for open country, and, besides being cooler, is better adapted for crawling while stalking than almost any other rig. Trousers are quite as good a protection from thorn as any form of breeches, and, besides, are better suited to a hot climate. Leggings may be worn if desired, but should be made of some fairly soft material, as tanned canvas or felt. They are certainly cooler than putties, and the "support" given by the latter is, I think, exaggerated, though they would be invaluable where the sportsman was afflicted with varicose veins in the legs. It is a mistake to use any material for trousers to which grass seeds adhere easily, and also to have the shirt so close fitting or its material of such a nature that it readily gets clammy with perspiration, and sticks. Pockets should be put in well at the side and fairly low down, otherwise the material in them may chafe the nipples. Thick shirting is a sufficient protection against sun anywhere south of lat. 10°, and does away with the necessity and discomfort of spine-pads, and it is really cooler and more comfortable to walk in than thin stuff. A complete change of clothes and socks every day before dinner is all one can expect if following game, but if three pairs of trousers, three shirts, and at least six pairs of socks, are taken, he ought to get on comfortably with that for a week at least, and pyjamas can be dispensed with.

Inflammation of the nipples from a chafing shirt, ulceration of the ankles from grass seeds, and sore feet, have to be guarded against, and these can be avoided if shirts and socks are changed often enough (the latter twice daily, if possible), even in the absence of enough water to wash properly. All scratches from thorns, &c., should be carefully washed with carbolic soap, or, if extensive, bathed with biniodide lotion, as soon as possible. One can nearly always get enough water to have a sponge down. It should be warmed, and care taken to avoid a chill, a likely enough occurrence during a rub or sponge down in the dark after a hard day, and the usual sequel to such a chill is malarial fever, possibly blackwater, and in any case

a spoiled trip. I do not consider the wearing of a cholera belt by those unaccustomed to them in any way essential.

Headgear.—A pith helmet is the safest headgear, and it must project enough at the back to shade the neck, and also be carried high enough behind to admit of shooting in the prone position without its tilting forward over the nose. There are no helmets made which are perfect in this respect, but the regulation "Gippy" is the best as far as shape goes. Helmets, constructed of cork, as most of the "shikari" patterns are, possess an almost metallic hardness and resound like a drum if tapped by a twig, and for this reason alone, to say nothing of their inferiority in protection, they cannot be considered on the same basis as those made of pith.

I am aware that many types of pith helmet put on creases the protective power of the hat and also the weight. The important points are the coloured handkerchief between the crown of the hat and the top of the head, and the ventilating band round the inside.

Footwear.—The type of boot worn must depend on the kind of country and as to whether the sportsman has "hard" or "soft" feet, and is accustomed to a support round the ankles. In approaching large and dangerous game to shoot which it is necessary to get quite close, some sort of footgear which is noiseless is absolutely essential.

Boots with felt soles are excellent, but cheap rope-soled shoes do quite well, and with stout canvas "continuations" a sort of boot is obtained which is light, noiseless and proof against grass seeds. A single pair of these is good for 150 miles, costs 2s., and should have the sole steeped in water before using for the first

back to front admit of free movement of the head in any of the shooting postures, but rather than run the risk of spoiling a shot, or dropping one's helmet while stalking, I think it better to wear a felt hat when closing on game. It can be carried by a gun boy and handed along with the rifle. Most felt hats are far too heavy, specially the ordinary double terai. The simplest arrangement is to have a single, fairly wide, thick felt hat fitted with a head band supported on corks, as is done in the ordinary helmet. This allows of free ventilation and keeps the temples well away from the side of the hat. A large coloured (preferably orange) silk handkerchief should be bunched into the crown before putting on the head. Such an arrangement sticks on, is as light or lighter than a helmet, and is almost as efficient a protection against sun. I gave this a good trial in September, 1904, in the Loangwa Valley, and was surprised at the efficacy of the arrangement. I hear, in spite of a terrific sun, some of the farmers go about in panama hats with a handkerchief inside. A puggaree may or may not be worn. It in-

time. One elephant hunter I know wears ordinary boots when following on a spoor and changes into these shoes when he gets close to his game. They, however, give but a poor grip on smooth grass, but on stones, burnt grass and on ground covered with dry twigs, they are much better than leather in any form. I have not given strong corrugated rubber a trial, but certainly a boot with soft leather upper (as doeskin) and a sole of rubber with inside sole of cork would be an excellent article for all sorts of country and would not "draw" the feet. Above all, boots with heavy uppers and thick soles are to be avoided, specially soles which are inflexible, a character they are apt to assume if screwed on.

The stiff soles cause sore feet, and it is impossible to tread noiselessly in heavy boots. I have tried veldtschoon and can speak highly of them, but they slip on grass. A Canadian friend advises moccasins, and certainly in theory they appear to be most suitable. For soft ground or swamp I would prefer field boots, but on all other kinds of country they are at a dis-

advantage compared with the types mentioned above, and they are heavy. To a man who has always been accustomed to walk and shoot in leather boots of the usual heavy sporting type, a sudden change to the light types of foot gear I have indicated may be inconvenient. The only alternative, then, to attain the desired degree of noiselessness when approaching game is to devise some sort of sole or golosh which can be slipped on. This would certainly be quicker than the change into rope soles practised by the elephant hunter before mentioned. I should think that an intelligent bootmaker could turn out something of the nature of a snow-boot, or better still, a felt sole with toe-cap to strap on, which would meet the case. Failing that I would suggest a supply of very large and thick socks to pull over the boot, or even a strip of calico to be wound round. Leggings have been dealt with under clothing.

It only remains to state that a material as leather, which make a noise on impact with twigs and grass, and which is apt to chafe at the ankles, is undesirable.

Mosquito Net.—A tent is a quite unnecessary adjunct to a short hunting trip in the dry season in Africa, but a mosquito net is essential, and the arrangement detailed below gives one the advantage of a mosquito-proof room whose weight as a load is under 5 lbs. I had a net made by Silver and Edgington, of Cornhill, to fit inside their small size double-roofed tents. Its dimensions are: length, 7 ft.; height, 6½ ft.; breadth, 6½ ft.; the side is vertical for a height of 2 feet and is edged with linen for 6 inches up round the foot. It has rings and cord at each corner, and it is unnecessary to carry pegs. At one end the two-foot vertical side is double. The outside layer is attached down the vertical seam at one side and is free at the other, and the inner layer is attached the opposite way, so as to form a sort of trap tunnel running the whole length of the end of the tent, viz., 6½ feet. No mosquito has ever got through this, and though it may be slightly awkward to enter, yet even a "boy" cannot leave the trap open. The mesh is 16 to the inch. I would advise, however, that in the construction of a net for a similar purpose all these dimensions (except the mesh) be exceeded, specially the vertical side one, but I may remark that even when made of the size I have detailed it forms a most convenient fly-proof shelter to do writing or microscope work in when in one's bare camp. On reaching the proposed camping ground my boys observe the following routine: Grass or palm leaves are laid on the ground and the machilla cover (a piece of green canvas of the same size as the floor area of the net) is laid on the top. It improves matters to lay down two logs at one side under the canvas to keep the grass between them heaped up, and on this part, but above the canvas, the bed blankets are laid. The food box is now inverted on the canvas to form a table and the net is spread over all and tied to trees or poles, and if it is intended to occupy the camp during any part of the day, a grass or leaf roof is built over all. The net is well stretched out, the strings pegged to sticks and the linen border is tucked under the canvas floor. I do not take much trouble to camp away from mosquito haunts, as one spends almost all one's time in camp, specially in the evening, under the net. Having dinner inside is simple. One boy sits inside the net at one end of the trap and another boy sits outside at the other end, and they pass the viands to each other along the tunnel. The floor, one sits on it, of course, is clean (being canvas) and soft, and it is better not to wear boots. If one stays in camp during the day the net comes in as an effectual barrier against the onslaughts of "hippo" flies and the numerous other winged torments with which Africa has been so liberally endowed, and when not set up packs into a pillow slip, and can be used as a machilla cushion.

This arrangement does, I know, sound very complicated, but is not so in reality, and the dullest "boy" will set it up correctly, having once been shown the way, and as regards a bed, anybody who has tried a grass or palm-leaf one, made by a native, knows how favourably it compares with the camp pattern of English make.

Sterilisation of Water.—The following method is easy to carry out and is always available. It has been used by myself and every member of our party for two seasons, and to its faithful performance I largely attribute our entire freedom from dysentery.

It is specially important to attend carefully to the sterilisation of water during a shooting trip. One is not a free agent as regards choice of water supply, and has usually to take it from the same place as the game go to drink. Such water is often polluted in the extreme.

I carry water with me each day in two canvas bags, a sufficient quantity to do all that day and the following morning, and it is prepared as follows:—

At night after dinner water is put in the largest pan or in an iron drum, if one is carried. In this it is boiled for half an hour. If there is time the sediment is allowed to settle, but in any case it is passed that night, whether it is still warm or not, through a small Berkefeld filter into the canvas water-bottles, which are hung up in a draught and are cool by the morning. By having four bottles, two can be used each day and no excuse given to the boys to dodge the process. Tea should, however, be drunk in place of water when possible, not that the tea is more or even as sterile as water prepared by the above process, but it is more refreshing and does not conduce to the consumption of such a volume of fluid. If the water is ammoniacal, as it so often is in rhino country or where there is much elephant dung about, it requires a lot of boiling, add a pinch of alum or some permanganate of potash and baking powder, and it should, after these have been added and the boiling is finished, be strained through calico before being run into the filter. The awful decoction produced by the rotting of leaves in an old water-hole should have some alum added and some time allowed to elapse before the less inky upper layers are decanted off to be boiled and filtered. I do not advise, however, the indiscriminate use of alum as practised by many sportsmen and recommended by most books. Its action is purely mechanical. It tastes the water and it does not improve digestion. The rule to go on is, "sterilise the water by boiling and get the sediment out and complete the sterilisation with the filter." The white milky appearance seen in many samples of upland plain or "dambo" water is almost

impossible to eradicate. It will not precipitate and passes through a filter at least to a small extent. Treated by boiling and filtration, the water is quite safe, the white matter remaining being a fine clay in suspension, which is harmless.

Boys are easily trained to carry out this process, but it is well to have the boiling water brought for inspection every night, and any special treatment of the water must, of course, be supervised.

Machilla, Drugs, &c.—My somewhat scanty list of drugs is, I think, justified, when it is considered that a man does not go on short shooting trips when unwell. If he takes sufficient material with him to ward off malaria and to regulate his bowels, and is provided with a hammock to sleep in should it rain and to travel in should anything happen, the only contingency he cannot make adequate provision for is a serious accident. It is chiefly on this account that I would insist on a hammock, or rather machilla, being taken. He will be alone and he will have to render first aid to himself, and if his injury results from an unfortunate encounter with one of the larger pachyderms or carnivoræ will be very lucky if he is able to treat primary symptoms with the hypodermic remedies at his disposal, to get his boy to put on temporary dressings, and to survive a journey in his machilla to the nearest white man. If two or more men shoot together, they can arrange a little surgical equipment of their own, but these notes have been penned for the perusal of the sportsman who prefers to be untrammelled by other people's arrangements and do his hunting alone.

In conclusion, I wish to point out that in writing the above there has been no attempt to recommend anything which is not essential. The chase is the primary consideration and its most valuable adjunct is health and mobility. At the same time non-observation of simple rules for the prevention of disease will certainly meet its due reward. Even the most experienced sportsman is liable to be severely or even fatally injured, that is an accident; but the contraction of malaria, blackwater or dysentery during or after a shoot is by no means likely to be an unpreventible occurrence and can be avoided by taking care. The cheapness of the kit specified will not appeal to the "sporting outfitter." I have made no attempt to recommend anything for cheapness sake, and would advise any one willing to spend money on a sporting outfit for Africa to put it in rifles. It has never paid anyone to economise in that direction.

IMPACTION OF THE BOWELS WITH INFLAMMATION AND PERITYPHLITIS.

By Major G. H. Fink, M.R.C.S., L.S.A.(Lond.), I.M.S. (Retd.).

Impaction of the bowels with inflammation and perityphlitis terminating in suppuration and abscess around the cæcum and appendix is a complaint which is by no means uncommon in Europe as well as in India; but it requires the utmost care in the treatment from the very commencement to prevent suppuration and an abscess forming, and such a happy termination is by no means rare in the annals of medicine.

Etiology or Cause.—(*a*) Insufficient mastication or bolting of food, due to bad teeth or an edentulous condition; (*b*) indulgence in a too free meat diet with unsuitable articles of food of a highly spiced character; (*c*) insufficient rest in a semi-recumbent position after meals; (*d*) loss of peristaltic action of the bowels through loss of nervous control produced by too long and late hours, irregularity in meals, and want of proper rest or sleep at night; (*e*) defective action of the ileo-cæcal valve and the glands of the intestines and vermiform appendix which are found in and around this neighbourhood, which I drew attention to some years ago in my article in the *Indian Medical Record* of July 16th, 1896, on "Typhoid Fever Immunisation, and the Manner of the God of the Land"; (*f*) sudden chills of the abdominal organs, particularly the liver, which fails to secrete bile in proper quantity and quality, which aids in the mechanical process of digestion, the saponifying of fats for the lubricating of this part of the bowels where the bile-duct opens, as well as for the prevention of the decomposition of the food; (*g*) insufficient attention to the proper action of the bowels daily; (*h*) tight-lacing and clothing, which hinder the normal functions of the abdominal region and organs.

Symptoms.—Nausea or probably vomiting, followed by difficulty in passing stools; pain in the abdomen, chiefly in the region of the cæcum and ileo-cæcal orifice, which increases the difficulty and strain, tenderness of the belly, followed by a high temperature, which gradually increases with the persistent constipation; headache follows; thirst; dry tongue which furs rapidly; bad odour in breath, which gets worse as the bowels cease to act properly, and the tongue remains dirty.

The abdomen gradually becomes hard like a board, and there are slight colicky pains sometimes, which are relieved by the drawing up of the knees towards the chin. Exhaustion follows the pain, and the skin becomes dry; thirst is increased; the pulse is quick and inclined to be wiry; the respiration short and quick.

Prognosis.—Always grave—in fact, there is grave danger.

Treatment.—Absolute rest in bed.

The bowels should be relieved immediately by giving a full dose of castor-oil in hot milk and a little brandy to prevent exhaustion which sets in rapidly in some cases after a purgative is administered. If necessary, the castor-oil should be repeated a day or two after in half the original dose, provided the patient is seen soon after the attack.

Apply large linseed meal poultices with a little mustard in them over the whole surface of the abdomen in case of a chill being the additional cause.

As a rule, sleep is hard to procure, owing to the pain and feverish condition, when a hypodermic injection of morphia or internal administration of $\frac{1}{4}$ gr. to gr.ss. of morphia powder according to age and peculiar idiosyncrasies of the patient. Morphia, as a rule, is borne well, for it does not interfere with the action of the bowels, and there is great tolerance for this drug in such cases. I know of one case in particular which took as much as one grain of morphia twice a day

(mid-day and at bedtime) internally for a week, until all acute symptoms passed off, and sleep was established with most excellent results. Morphia in such cases not only gives rest and sleep but relieves pain; gives the bowels rest after the severe strain; cleans the tongue rapidly; produces free perspiration; reduces the fever and the pulse; promotes the natural action of the organs as well as improves digestion and the appetite. No sooner the fever is lowered and there is this improvement in the acute symptoms, give quinine, 5 grs., every evening at 6 a.m. to keep down the temperature and combat any malarial tendency present; in India continue the quinine for a few days longer until the temperature is normal. If there should be subnormal temperature, discontinue quinine. The height of the temperature depends a great deal upon the length of time that there has been impaction of the bowel with constipation, which in some cases has been known to last over a week before being relieved, when there is great tendency for erosion of the mucous membrane to set in, followed by a severe burning sensation all along the cæcal region, which in some cases might terminate in ulceration of the bowel, perityphlitis and abscess.

Resorcin, 5 to 30 grs., should be given internally daily to act as an antiseptic on the stools, particularly where the liver has struck work and is acting improperly.

Hot fomentations with a few drops of turpentine sprinkled over the flannel should be applied over the lower part of the abdomen, especially along the lumbar, umbilical, and hypogastric regions every third or fourth hour, as it is very soothing and often prevents suppuration occurring. After the fomentations, gentle rubbing with olive oil over the fomented parts is also very grateful to the patient.

Diet.—Everything given must be cold, viz., cold milk, barley water, Brand's essence of chicken, chicken broth; linseed tea with ice in it should be given at regular intervals to the patient to support his strength every second hour. Small lumps of ice to suck to relieve thirst.

Later on, when this diet is well borne and there are no untoward symptoms, improve the diet gradually to soups, fish, "pishpash," porridge and milk, chicken stew, and so on, feeling one's way very gradually from day to day. In order to aid digestion give liquor pepticus, ʒi. to ʒii. in water, with two teaspoonfuls of brandy in it, after each meal. Later on, a glass of champagne with the mid-day meal, and one with the evening meal, which should not be later than 7 p.m., as it enables the patient to pick up strength rapidly and improves the appetite.

Tonic.—℞. Tincturæ Nucis Vomicæ, ♏ iii.-v., t.d.s., in water.

Regulate the bowels throughout the after-treatment with occasional doses of castor-oil, or a warm enema with a few grains of boracic acid in it as an antiseptic.

Clothing.—Flannels. Change the clothes and bedclothes if damp with perspiration to prevent chills.

Some patients find it difficult to use the bed-pan and cannot micturate in bed while lying down, in which case great care must be exercised in allowing the use of the commode, when a nurse or attendant should always be present to help the patient in and out of bed, since the act of sitting up is very exhausting, and a bottle of smelling-salts should be kept near at hand for the patient should it be needed.

Hygiene.—The room requires free ventilation twice a day, and all pans, &c., should be kept scrupulously clean.

As a rule it is not safe to allow the patient carriage exercise too early. A bath-chair is the best at first, and this must be prescribed carefully in the beginning until his strength improves, and not until six weeks have passed off from the commencement of the attack is the patient fit to be allowed to get about by himself, and then with aid, when a change to the country or seaside should be recommended.

For some months after, every care in the diet is necessary, and the bowels need regulating. Nothing in my opinion is so useful as castor-oil, for it lubricates the passage and removes all irritation.

Salts and mineral waters are in my opinion most dangerous, as they inflate the bowels by attracting watery constituents, which to an injured surface is the very worst thing to administer.

Painting the skin of the part which has been affected with Lin. iodine once or twice a week is very useful in reducing the hard brawny condition which is left after averting suppuration, for it restores the part to its natural and supple condition.

Plenty of ripe fruit is recommended during convalescence.

"Archiv. Gen. de Med.," June 20, 1905.

Leprosy. E. Weil.

With age the bacilli become less resistant as the lesions involute. They are easily decolourised by acids, do not stain by Gram and sometimes take blue stains; so that the test of any possible culture must be the presence of bacilli with staining of young bacilli.

Lumbar puncture was made in five cases. One case was tubercular leprosy, one of nerve (anæsthetics), and three of mixed type. One case was examined during an accentuation of the eruption with fever. These cases confirm the two cases previously examined by Jeanselme. There were neither bacilli nor lymphocytosis.

T. P. B.

"Gazette des Hopitaux," June 15, 1905.

Botryomycetes of the Foot. Barres.

A native was admitted to hospital at Hanoi with a sore on the plantar surface of the foot, which constantly bled; there was little pain. It was originally due to a wound from a splinter of bambo; the patient continued to go barefooted, though the wound continued to discharge slightly. The edges were thickened and corneous, in the centre was flat granular swelling; on raising this a fairly large pedicle was seen; the depression contained thick yellow pus. Curetting and the application of chloride of zinc 1 in 10 caused the wound to heal in a week. Cultures showed pure staphylococci, which were also found in section of the growth. Plantar warts, the author objects to the term botryomycetes, are very rare even in barefoot natives.

T. P. B.

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THE

Journal of Tropical Medicine

AUGUST 1, 1905.

BRITISH MEDICAL ASSOCIATION ANNUAL MEETING, LEICESTER, 1905.

SECTION OF TROPICAL MEDICINE.

Abstract of Proceedings.

President: Rubert Wm. Boyce, M.B., F.R.S., Liverpool. *Vice-Presidents:* Andrew Duncan, M.D., London; Fleming Mant Sandwith, M.D., F.R.C.P., London. *Honorary Secretaries:* George Aylwin Clarkson, F.R.C.S., 173, London Road, Leicester; John M. Hendrie Macleod, M.D., 11, Harley Street, W.

OPENING ADDRESS

BY

PROFESSOR RUBERT WM. BOYCE, M.B., F.R.S.

The Year's Progress in Tropical Medicine.

DURING the year progress has been made in the departments of Tropical Medicine which formed the subject of discussion at the meeting of the Section in 1904, namely, the prophylaxis of malaria, trypanosomiasis, and in our knowledge of the Leishman-Donovan bodies. Colonel Bruce then expressed the belief that trypanosoma fever was probably only an early stage of sleeping sickness, and extended experiments serve to confirm this view. Experimental enquiry by Thomas demonstrates the remarkable arsenite action in the lower animals of an atoxyl-aniline arsenic compound, and it now remains to prove the efficacy of these drugs in cases of sleeping sickness in man. Our knowledge of the new parasite associated with the names of Leishman, Donovan, Marchand and Wright has been increased by Rogers, Leishman, Donovan, Christophers, Balfour and others. Bentley has thrown further light on protozoology in disease; James and Patton have described leucocytozoa in certain mammals; Balfour and Christophers have found hæmogregarines in the red cells of certain mammals. The tick which Christy sent from Uganda to England has been identified as the *Ornithodoros moubata*. Ross and Milne made the interesting discovery that spirochætæ were present in the blood of cases of tick-fever. Dutton and Todd succeeded in infecting the monkey and rat by means of ticks infected by feeding upon the blood of cases of tick-fever in man. The same observers declare also that clinically tick-fever and relapsing fever in man are identical. The elucidation of the manner of infection in Malta fever has been advanced by Bruce and others.

One of the most remarkable features of advance in Tropical Medicine has been the fact that the botanist, the zoologist, the dipterologist, the helminthologist and the protozoologist have all been called in to help in the investigation of disease, and each and all are now to be found in every well-organised tropical medical laboratory. Medicine owes a great debt to active zoologists like Loos, of Cairo, and Shipley in this country, but as yet we do not give them sufficient encouragement. We require their co-operation, for there are vast fields awaiting their investigations. In the public services the medical officers have recently shown an activity and interest in investigation which is highly encouraging, and much good work has been and is being done by them.

Success in the newer methods of malaria prophylaxis has been reported from Klang and Port

Swettenham in the Federated Malay States by Dr. Malcolm Watson. Atkinson shows that in Hong Kong cases of malaria have been materially reduced by following antimalarial measures, and from many other towns and countries satisfactory reports in the same direction are being continually received.

The following papers were read at the meeting :—

Wednesday, July 26, 1905.

(1) The Nature of Human Tick-Fever in the Eastern Part of the Congo Free State, with Notes on the Distribution and Bionomics of the Tick. By J. Everett Dutton, M.B.(Vict.), late Walter Myers Fellow of the Liverpool School of Tropical Medicine, and John L. Todd, M.D.(McGill).

(2) On the Pathogenic Ticks Concerned in the Distribution of Disease in Man, with Special Reference to the Differential Characters in *Ornithodoros moubata*. By R. Newstead, A.L.S., Lecturer in Economic Entomology and Parasitology, Liverpool School of Tropical Medicine.

The following joined in the discussion: Dr. L. Westerna Sambon, Major Ronald Ross, C.B., Dr. J. C. Graham, Dr. Albert J. Chalmers, and Mr. J. Cantlie.

(3) Bruhl's Disease, with Special Reference to the Blood Changes Found, and Connection with the Leishman-Donovan Bodies. By P. W. Bassett-Smith, Fleet-Surgeon R.N., Haslar.

(4) Notes on Two Cases of Febrile Tropical Splenomegaly (Kala-Azar), and a Suggestion. By Sir Patrick Manson, K.C.M.G., F.R.S.

(5) Guinea-worm and its Hosts. By W. M. Graham, M.B.

In the discussion, Dr. W. C. Brown, Dr. A. T. Chalmers, Dr. F. M. Sandwith, Dr. L. W. Sambon, Dr. W. T. Prout, C.M.G., Dr. J. Tertius Clarke, Dr. C. F. Harford, Dr. Schilling, Mr. R. Newstead, and Dr. D. E. Anderson took part.

Thursday, July 27.

(1) Tropical Diseases of the Skin. The discussion was opened by J. M. H. MacLeod, M.D., M.R.C.P., Lecturer on Diseases of the Skin, London School of Tropical Medicine.

(2) Pinta. By F. M. Sandwith, M.D., F.R.C.P., Consulting Physician to Kasr-el-Ainy Hospital, Cairo; Lecturer, London School of Tropical Medicine.

(3) Pellagra. By L. W. Sambon, M.D.(Naples), Lecturer, London School of Tropical Medicine.

(4) Notes on Frambœsia Tropica. By J. Campbell Graham, M.D., Deli, Sumatra.

(5) Notes on Pian (Yaws) in French Indo-China. By M. E. Jeanselme, M.D., Professeur Agrégé à la Faculté de Medécine de Paris. (This paper was translated and abridged by Dr. F. M. Sandwith.)

(6) A Communication on a Tropical Skin Disease. By John Bell, M.R.C.S., L.R.C.P., Superintendent, Government Civil Hospital, Hong Kong.

(7) Involvement of the Scalp in Leprosy. By George Pernet, M.R.C.S., L.R.C.P., Assistant to the Skin Department, University College Hospital, London.

(8) The following papers were communicated by Dr. Aldo Castellani, Colombo, Ceylon :—

(*a*) On the Presence of Spirochætes in Two Cases of Ulcerated Parangi (Yaws).

(*b*) Observations on "Dhobie Itch," and other Tropical Tricophytic Diseases.

(*c*) Tropical Forms of Pityriasis Versicolor.

(9) Leprosy, with demonstration of coloured slides. By Dr. Karl Grossman.

The following took part in the discussions : Professor Boyce, F.R.S., Dr. Radcliffe Crocker, Dr. F. M. Sandwith, Major G. H. Fink, and Mr. J. Cantlie.

Friday, July 28.

(1) Sprue. By James Cantlie, M.B., F.R.C.S., Lecturer, London School of Tropical Medicine.

(2) Hill Diarrhœa. By Lieut.-Colonel Andrew Duncan, I.M.S., M.D., F.R.C.S.

The following took part in the discussion: Dr. L. W. Sambon, Dr. David J. Galloway, Dr. John Haddon, Dr. A. J. Chalmers, Dr. J. C. Graham, Dr. F. O. Stedman, Dr. C. F. Harford, Major Fink, and Dr. John Hutson.

(3) On the Present Theories of the Cause of Beriberi. By J. Tertius Clarke, M.R.C.S., L.R.C.P.

(2) The Several Theories Advanced as a Cause of Beri-beri. By Hamilton Wright, M.D.(McGill), late Director, Institute Medical Research, Federated Malay States.

(3) Note on Two Cases of Beri-beri Paresis Treated with Strychinine Injections. By R. Tanner Hewlett, M.D., M.R.C.P., Professor of General Pathology and Bacteriology, King's College, London; Lecturer in Bacteriology, London School of Tropical Medicine.

The following took part in the discussion on Beriberi: Dr. F. O. Stedman, Dr. D. J. Galloway, Mr. J. Cantlie, Dr. J. C. Graham, Dr. L. W. Sambon, Professor Boyce, and Dr. W. L. Strain.

(4) Diarrhœa from Flagellates. By Dr. Aldo Castellani, Colombo, Ceylon.

(5) Blood Counts in Acute Hepatitis and Amœbic Abscess of the Liver, with Further Experience of the Relationship of the *Amœba dysenterica* to Tropical Liver Abscess. By Leonard Rogers, M.D., Capt. I.M.S.

(8) Seven Recent Cases of Liver Abscess. By James Cantlie, M.B., F.R.C.S., Lecturer in Surgery, London School of Tropical Medicine.

(9) Note on the Method of Taking Quinine in the Prophylaxis of Malaria. By St. George Gray, M.B., Sierra Leone.

(10) Two Further Cases of Snake-bite Successfully Treated by Local Applications of Permanganate of Potash, with Suggestions for Extension of its Use. By Leonard Rogers, M.D., Capt. I.M.S.

(11) The Mosquito-Malarial Theory and Malarial Prophylaxis from the Latent Phase. By Major G. H. Fink, I.M.S.

(12) Malarial Fever in British Central Africa. H. Hearsey, M.D., Principal Medical Officer, British Central Africa.

(13) Note on a Peculiar Schistosomum Egg. By S. R. Christophers, M.B.(Vict.), I.M.S., and J. W. W. Stephens, M.D.(Cantab.), Liverpool School of Tropical Medicine.

ENTERTAINMENT AT THE WELLCOME CLUB AND INSTITUTE.

On Saturday, July 15th, the occasion of Burroughs, Wellcome & Co.'s Quarter Century Commemoration, the members of the Society of Chemical Industry, and a number of medical, scientific and other distinguished guests, paid a visit to the firm's works at Dartford, Kent, and to the Wellcome Club and Institute, founded for the benefit of the employees. The guests were conveyed by three special trains, two from Charing Cross and one from Cannon Street. Upon arrival at the station an alarm of fire was given from the platform by means of a special button, and the proceedings commenced with a smart display of fire drill by the firm's private brigade. The guests numbered about 2,000, and were entertained to luncheon in a large marquee erected in the Club grounds.

After the loyal toasts, Mr. Wellcome proposed the "Society of Chemical Industry."

Dr. W. H. Nicholls, the President, replied, and referred to the wonderful organisation shown in the firm's works and in the arrangements for the reception and entertainment of the visitors during the day.

Mr. Wellcome proposed "The Employees," and presented them with a silver gilt cup in remembrance of the fact that the Wellcome Cricket Club had won the championship of the Chemists' and Druggists' Cricket League for five years in succession.

Mr. R. Clay Sudlow, General Manager, replied.

Professor Armstrong proposed the toast of "Burroughs, Wellcome & Co., and referred to the fact that every important expedition which had started from British or foreign shores during recent years had been equipped by the firm.

After Mr. Wellcome had replied, "Medicine and Pharmacy" was proposed by Mr. A. Gordon Salamon, the toast being coupled with the names of Sir James Dick, Hon. Surgeon to H.M. the King, and Mr. R. A. Robinson, L.C.C. (President of the Pharmaceutical Society of Great Britain).

After luncheon the programme of entertainments was continued with athletic sports, maypole dances, garland and sword drill by employees, open-air concert, fireworks, illuminations, &c.

The prizes were distributed by Lady Manson, and Sir Patrick Manson speaking at one of the other functions, said that he felt that to-day had been an object-lesson to all of them not only of the heartfelt interest Mr. Wellcome had in the welfare of his employees, but of the wonderful organisation of the firm as exemplified in the forethought which had provided so bountifully for the comfort and pleasure of everyone throughout the day, and by the precision with which a wonderful programme had been carried through.

If he were asked to name the keynote of Mr. Wellcome's success, he would answer "simplicity," and having in mind and in memory the old-fashioned prescription, in which it was thought necessary to have twenty-five ingredients, he would like to express his thanks and that of other members of the medical profession to Mr. Wellcome for the marvellous way in which he had helped them in their work.

Especially in his own particular sphere of interest, namely, tropical medicine, he was in a position to know and to appreciate the debt of gratitude they owed Mr. Wellcome for his liberality in initiating and supporting research work. The results had already been most valuable, and the promise was greater still.

Review.

Precis de Pathologie Exotique. By A. Le Dantec. Paris: Doin. 12 francs.

This, the second edition, is not only replete with the latest information, but embraces every feature relating to tropical diseases. Its wealth of detail, clearness, and elegance of expression render the perusal of the work as pleasant as it is profitable. The description of the tropical diseases themselves is supplemented by suggestions bearing on numerous obscure points in pathology.

The author delivers a weighty judgment on the question of typhoid and paratyphoid. Anti-typhoid vaccination in subjects from the ages of 20 to 25 reduces the morbility from 77 to 27 per 100; in those between the ages of 25 to 30 the rate is reduced from 51 to 27; in patients over 30, it is detrimental. Many practical points of treatment are given; amongst others, when the supply of ice is scant or absent, the patient can be wrapped in a sheet wrung out of water at 104° F. and fanned (by an electric fan), by which the temperature is reduced; the procedure is repeated two or three times a day.

The views of British medical services in the Tropics are not less instructive than complimentary; the figures quoted in point are of interest, and show that with care great reduction in the death-rate in expeditions, may be effected.

		Proportion of Deaths from Diseases per 1,000.
Ashanti, 1873 ...	Europeans ...	18·2
	Natives ...	17·7
Dahomey, 1894...	Europeans ...	121·
	Natives ...	23·
Madagascar, 1895	Europeans ...	334·
	Colonials ...	154·

Of Peruvian warts, (Oroya fever), not only is the question of its pathology discussed, but the three clinical varieties are described: the chronic variety; the acute variety (Oroya fever) which is fatal before the appearance of the eruption; thirdly, the more chronic form where the eruption is the first symptom.

The whole question of yaws is summed up by stating that it is useless to discuss the relation between it and syphilis until more is known about extra-genital syphilis and malignant tropical syphilis.

The description of trypanosomas and piroplasmas is a marvel of lucidity, the whole question of protozoal diseases and tropical ulcers is expounded.

Considering the wealth of material the book contains in some thirteen hundred pages, it is a question

if it would not be desirable to publish separately the part dealing with climate and colonisation, the diseases due to cold, and the question of marine sanitation, perhaps also leprosy, because, though it is most common in the Tropics, yet its pathology is fully discussed in pathological text-books.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Geographie Medicale," Paris, 1905.

Medical Geography. By Dr. Emile Laurent. 830 pages.

Information on medical geography is to found in abundance in scientific works, but it is unfortunately scattered amongst a host of essays, memoirs and reports, &c., whilst not a single collective work on the subject is in existence.

Dr. Emile Laurent states in his preface that he has endeavoured to meet this want and "to supply in as concise and as complete a form as possible some exact medical information about every part of the world." He is to be congratulated on having successfully accomplished his object in view. The book needs only to be seen to be appreciated, and will probably shortly be found in the libraries of most consulting physicians and travellers.

As it is difficult to make extracts from a work of this size, a brief enumeration of its divisions is here given :—

Part I. deals with climatology and nosology generally.

Part II. is given up to the medical geography of France.

Part III. describes the medical geography of the rest of Europe.

Parts IV. to VII. deal severally with the medical geography of Asia, Oceania, Africa and America.

J. E. N.

Medical Congress, Wiesbaden, April, 1905.

Sleeping Sickness.

Lorand considers the condition is typically one of chronic cachexia; rarely there is an advanced myxœdematous condition with changes in the heart and nervous centres. The disease, like myxœdema, is often preceded by an infectious disease, trypanosomiasis, which, like other infectious diseases, presents symptoms of excessive thyroid action, high temperature, tachycardia, sweating, localised œdema, sleeping sickness, like myxœdema, shows itself a considerable time after the preceding infectious disease. Lorand recently had a case in an officer from the Congo benefitted by thyroid, his cerebro-spinal fluid showed trypanosomes.

T. P. B.

THE LONDON SCHOOL OF TROPICAL MEDICINE. EXAMINATION RESULT.

18TH SESSION. JULY, 1905.

Dr. J. T. C. Johnson (Colonial Service).	With Distinction.
Surgeon E. R. Stitt, U.S.N.	
Dr. D. Mackinnon (Colonial Service).	
Dr. F. E. Wood ,, ,,	
Miss Commissariat.	
Dr. W. L. M. Goldie (Colonial Service).	
Dr. J. S. Smith ,, ,,	
Dr. S. G. Allwood.	
Dr. E. V. Croker (Colonial Service).	
Dr. A. R. Wellington.	
Dr. E. Hopkinson (Colonial Service).	
Dr. J. T. Waite ,, ,,	
Dr. W. D. Inness ,, ,,	
Dr. N. Beaumont ,, ,,	
Dr. H. G. Waters	
Dr. T. E. F. Toovey (Colonial Service).	

EXCHANGES.

Annali di Medicina Navale. Annali d' Igiene Sperimentale Archiv für Schiffs u. Tropen Hygiene. Archives de Medicine Navale. Archives Russes de Pathologie, de Médec. Clinique et de Bacteriologie. Australasian Medical Gazette. Boletin de Medicina Naval. Boston Medical and Surgical Journal. Bristol Medico-Chirurgical Journal. British and Colonial Druggist. British Journal of Dermatology. British Medical Journal. Brooklyn Medical Journal. Caducée. Climate, Clinical Journal. Clinical Review. Giornale Medico del R. Esercito. Hong Kong Telegraph. Il Policlinico. Indian Medical Gazette. Indian Medical Record. Indian Public Health. Interstate Medical Journal. Jahresbericht. Janus. Journal of the Royal Army Medical Corps. Journal of Balneology and Climatology. Journal of Laryngology and Otology. Journal of the American Medical Association. La Grèce Médicale. Lancet. Liverpool Medico-Chirurgical Journal. Medical Brief. Medical Missionary Journal. Medical Record. Medical Review. Merck's Archives. New York Medical Journal. New York Post-Graduate. Pacific Medical Journal. Polyclinic. Public Health. Revista de Medicina Tropical. Revista Medica de S. Paulo. Sei-i-Kwai Medical Journal. The Hospital. The Northumberland and Durham Medical Journal. Transactions of the American Microscopical Society. Treatment. West India Committee Circular. West Africa.

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Original Communication.

A HÆMOGREGARINE OF MAMMALS—H. JACULI.

H. BALFOURI (LAVERAN).

By ANDREW BALFOUR, M.D., B.Sc., M.R.C.P.(Edin.), D.P.H.(Camb.).

Director, Wellcome Research Laboratories, Gordon College, Khartoum.

WHILE carrying out work in connection with trypanosomiasis I have had occasion to make numerous examinations of the blood of the jerboa or desert rat (*Jaculus jaculus*, or *J. gordoni*, as I believe it has been renamed) (fig. 1). In the first blood examined I was surprised to see that a large proportion of the red blood corpuscles harboured an unpigmented and non-motile parasite. In the stained specimen it was at once apparent that we were dealing with some kind of trophozoite. Twenty-nine jerboas have up to the

FIG. 1.

present been examined, and in all of them, with the exception of two very young animals, this parasite has been found. Specimens were sent to Professor Laveran, who at once declared the parasite to be a hæmogregarine, and has kindly informed me that the discovery is one of much interest. He has further urged me to publish some notes upon its life-history, although my observations are yet far from complete.

THE APPEARANCE OF THE PARASITE.

The trophozoite in the fresh blood appears as a pale, hyaline, homogeneous body, slightly curved and with rounded ends (sausage-shaped), lying either apparently free or in the remains of a red blood corpuscle. The latter may be represented only by a bow uniting the two poles of the parasite, just as it is sometimes seen in the case of malarial crescents. The free forms, I believe, owe their condition to a total destruction or absorption of the substance of the erythrocytes which once contained them. As stated, the parasite is non-pigmented and non-motile, and I have found it to be rather resistant, remaining to all appearance unchanged in sterile citrated blood for a period of seventy-two hours, both when kept at room temperature (about 36° C) and at 22° C. It is to be noted, however, that it altered somewhat in its staining reactions. As a rule, it measures from 5·6 to 7 μ in length, and from 1·4 to 2·8 μ in breadth. The number present has been found to vary considerably. There may be six or seven, or even more present in each microscopic field (Leitz oc. 4, oil imm. $\frac{1}{12}$th), or only a few may be found in the whole blood smear.

STAINING THE PARASITE.

On staining by the Leishman-Romanowsky method, in exactly the same way as for malaria protozoa, the structure of the parasite becomes at once apparent and the shape, as described above, well defined. A large oval nucleus, constituting, as a rule, about one-third of the organism, is seen to be present, situated generally in the centre of the parasite and stretching right across it, so that there is a deep blue staining area (the nucleus) in the middle, and a faintly staining blue area with a rounded end on either side. Occasionally, but rarely, and then usually under special conditions, spherical chromatin dots may be found in one or other of these pale polar areas. In stained preparations it is common to find that no vestige of the real blood corpuscle which originally harboured the parasite remains, but careful search will nearly always reveal one or two parasites with portions of the red-staining erythrocyte adhering to them. All that may be present is a thin, red curved line stretching from pole to pole across the slight concavity of the parasite (fig. 2). Sometimes, especially if the blood be citrated, the relation of the parasite to the blood cell which contains it is beautifully shown. A process of absorption of the cytoplasm of the red cell evidently goes on, and in a severe infection there must be a considerable destruction of erythrocytes. The animal host, however, does not seem to suffer in health. I have kept a jerboa with a considerable infection for three months in the laboratory, and it remained well and lively throughout the whole period. Two others died in captivity, exhibiting violent *ante-mortem* convulsions, and it is worth noting that these rodents do not stand handling well and must not be supplied with water.

In the peripheral blood it is customary to find all the parasites at or about the same stage of development. True, they differ somewhat in aspect. Thus it is not uncommon to find the nucleus situated at one pole, so that half the parasite stains a deep blue and the other half a very faint blue. Again, one end of the parasite may be pointed, so that the body is club-shaped. This is probably due to alteration during the preparation of the blood smears. In the heart's blood of a jerboa which died naturally I found two distinct forms, a large swollen variety (11·2 μ by 4·2 μ), in which the greatest increase had taken place in the light staining part of the protoplasm, and a form like those already described (fig. 3). It was very noticeable that the nuclei of the former, often of a triangular shape, stained a deep Romanowsky purple and frequently did not stretch wholly across the parasite, and in the large pale-staining area three or four spherical chromatin dots were often to be observed.

Professor Laveran has seen this preparation and points out that such peculiarities in morphology frequently occur. He does not regard these as special

sexual forms. At first I was inclined to consider the parasite as being allied to the halteridium of birds. I noted, however, that it was not pigmented, was not curved so much as the halteridium forms, and never exhibited the spore formation at either end as does *Halteridium danilewsky*.

Endoglobular Hæmogregarine of this Class not Found Previously in the Red Corpuscles of Mammals.

As Professor Laveran kindly pointed out to me, and as indeed was soon apparent from a study of the literature, especially Professor Minchin's treatise on the sporozoa, this parasite of jerboa closely resembles the *Hæmogregarinidæ* of cold-blooded vertebrates. This fact is of extreme interest, as I am unaware of any endoglobular parasite of this class having been described in the blood of mammals. Bentley[1] has recently produced a paper on a leucocytozöon of the dog in Assam, but I understand there is some doubt as to his parasite (also described by James[2]), which moreover affects the leucocytes. The classification of this order of parasites given by Professor Minchin is as follows:—

"Order *Hæmosporidia* (Danilewsky).

"Sub-order I. *Hæmosporea.*

"Genus i. *Lankesterella* (Labbé, 1899) for *Drepanidium* (Lankester). The hæmogregarine is not more than three-quarters the length of the blood corpuscle it inhabits.

"Genus ii. *Karyolysus* (Labbé, 1894). The hæmogregarine does not exceed the corpuscle in length.

"Genus iii. *Hæmogregarine* (Danilewsky, 1897) (syn. Danilewsky-Labbé, 1895).

"The body of the parasite when adult exceeds the corpuscle in length and is bent on itself within it in a characteristic manner like the letter V."

Now the parasite of the jerboa in question does slightly exceed the corpuscle in length, but is only slightly curved. It looks, as a rule, as if it had outgrown its corpuscle, and sometimes the remains of what has evidently been a distended and distorted corpuscle can be seen lying around it. The large swollen and bloated forms are much larger than the corpuscles which originally contained them and are found lying free. On several occasions, and especially in fresh preparations from the bone-marrow, I have noted forms slightly turned up at one end and looking like an incomplete letter V. I have not been able to demonstrate this appearance in stained specimens.

Laveran's classification, in which the genus *Hæmogregarine* is made to include *Drepanidium* and *Karyolysus*, is more simple, but whichever be adopted, it would seem that this parasite is undoubtedly a hæmogregarine, and I propose to give it the provisional name of *H. jaculi*,* though it is quite possible it may be found in other mammals. Indeed, I have recently discovered what seems to be the same parasite in the mononuclear leucocyte of the Norway rat (*Mus decumanus*) in Khartoum (fig. 4). It is probable that it exists as a leucocytozöon in the rodents, but further observations are required. I have once found free forms in smears from the splenic pulp of a Norway rat.

* Professor Laveran has recently written me to say that he has given the name of *H. balfouri* to this parasite.

Reverting to the parasite of the jerboa, a study of its life-history has further indicated its relation to the *Hæmogregarinidæ*, for I have succeeded in finding two further stages, *i.e.*:—

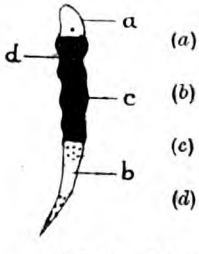
(1) The free, motile vermicule form.

(2) The stage of schizonts in the form of cytocysts.

In one instance only have I found the free trophozoite. I discovered two such forms in the peripheral blood of a jerboa, which showed the endoglobular trophozoite in fair numbers and which had some injections of the serum of a water-buck in connection with trypanosome work.

A Free Form of the Parasite.

This free form is in length about three times the diameter of a red blood corpuscle, is pointed at both ends, and moves very slowly through the blood, progressing by a series of contractions of its cytoplasm, the so-called "euglenoid" movements. As a result constrictions appear in the body of the parasite, as many as three having been seen present at one time. These, so to speak, run along the body of the parasite, which thereafter assumes its usual cylindrical shape and glides steadily across the field, always proceeding in one direction and with the same end in front. It pauses for greater or longer periods, undergoing various alterations in shape. If it encounters a clump of red blood corpuscles it disappears amongst them, producing only a slight agitation amongst the erythrocytes, which it pushes out of its way. Granules are visible in the posterior part of the body. No flagellum has been seen nor anything to suggest the extrusion of a gelatinous thread, as occurs in the case of some of the gregarines. I have been fortunate enough to secure a stained preparation of this free trophozoite, the appearance of which further demonstrates its resemblance to a hæmogregarine (fig. 5).



(*a*) Anterior light shining area.

(*b*) Posterior ,, ,, ,,

(*c*) Nucleus.

(*d*) Constriction.

Fig. 5.—A Free Trophozoite.

(Figs. 2, 3 and 4, see Plate.)

Anteriorly there is a somewhat sharp-pointed area staining a light blue and in which close to the nucleus a chromatin dot is visible. Following this clear area comes a very lengthy, oblong, deeply stained nucleus. At one point it showed a constriction similar, no doubt, to those seen in the fresh preparation. It had been killed, fixed, and stained in the act of progression.

Behind the nucleus is a lengthy, light-staining area, terminating in a pointed extremity. This area stains a light blue with the Leishman stain and exhibits a cluster of chromatin dots, arranged in a somewhat rosette form immediately behind the nucleus. I noted a single central dot with six others arranged in a circle around it. A few similar dots, irregularly arranged, are also visible close to the posterior extremity.

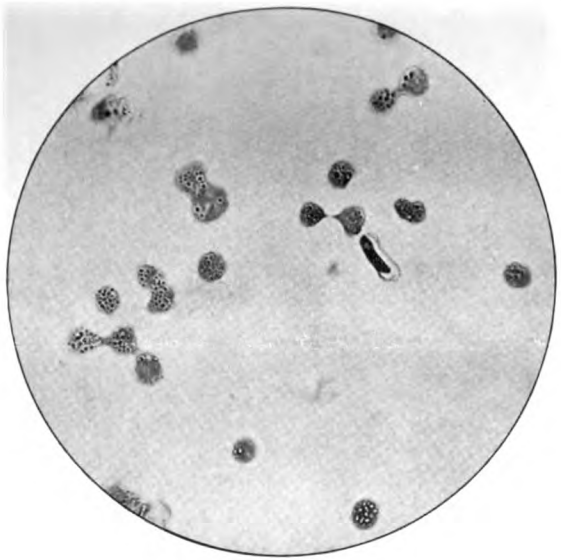


FIG. 2.

FIG. 3.

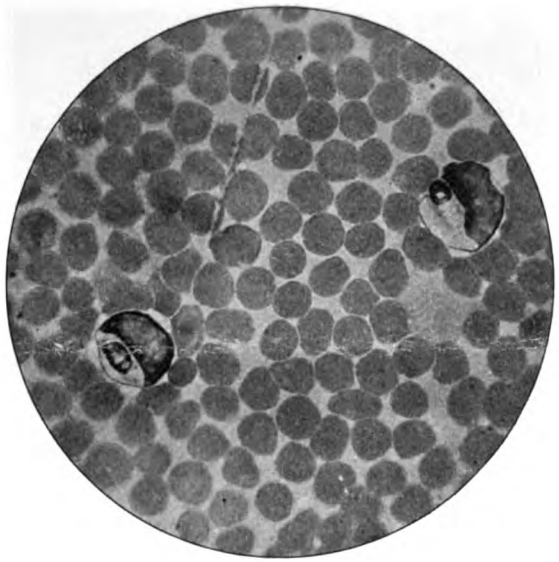


FIG. 4.

FIG. 6.

FIG. 7.

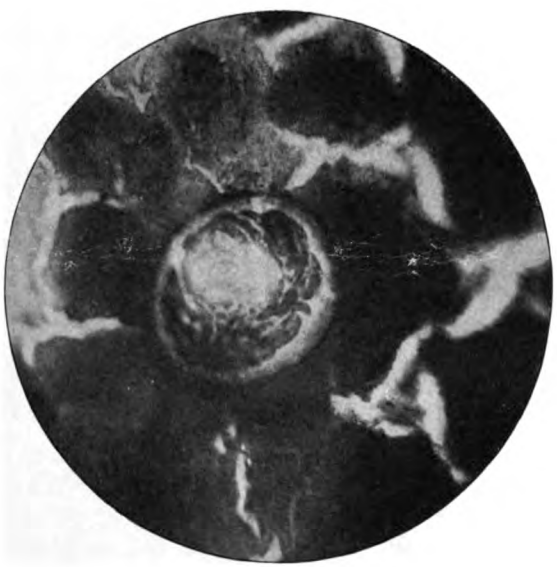


FIG. 8.

To Illustrate Dr. ANDREW BALFOUR'S article, "A Hæmogregarine of Mammals."

Measurements :—

Total length	15·5 μ
Length of nucleus	7 μ
Length of anterior light area ...	2·8 μ
Length of posterior light area ...	5·7 μ
Greatest breadth	2·8 μ

The nucleus, it may be said, stretches completely across the body, entirely separating the anterior from the posterior moiety. The broadest part of the parasite is towards the posterior end of the nucleus. In most cases a third stage can be readily demonstrated. This is chiefly seen in the liver and kidney, organs where the circulation is slow, and will probably be found also in the bone-marrow and brain. Indeed, some smears of the bone-marrow have shown what were probably empty cytocysts. In thick smears from the liver and kidney well-defined cysts are found, the walls of which are apparently formed by the remains of cells of these organs which have been destroyed by the parasitic growth (fig. 6)

These cysts vary much in size. The largest I have noted occurred in a liver smear and measured 39·6 μ by 33·6 μ. A common dimension appears to be about 22·4 μ by 16·8 μ, but many smaller cysts occur (fig. 7).

It is usual to find some of these cytocysts empty, or at the most containing a little residual protoplasm, but a certain proportion are found to contain merozoites (fig. 8), readily recognisable by their shape and nuclei, and somewhat resembling the trophozoite stage in the blood. Their nuclei, however, are comparatively small, and in many cases the merozoite appears to be longer and more pointed at the ends than the endoglobular trophozoite.

Schizont Forms.

Early schizont forms also occur, in which the protoplasm contained within the cyst wall has not become differentiated and stains more or less uniformly. Sometimes darker-staining portions indicate the future nuclei of the merozoites. When complete division has taken place some residual protoplasm remains behind, and the whole condition is very like that which has been described by Labbé[3] in the case of *Karyolysus lacertarum*. Sections of the liver stained by the Giemsa method show all stages of the schizonts. Mitosis of the nuclei and the formation of daughter nuclei are well seen.

Appearances very like those presented during the schizogony of some of the Coccidia, notably *Adelea ovata*, are exhibited and the whole condition from the invasion of the liver cell to the bursting of the cyst and the freeing of its contents can be traced. The merozoites in a ripe cyst can be seen to be arranged side by side nearly all round the periphery of the central undifferentiated mass of protoplasm which remains as the residuum.

By what channel the hepatic cell is invaded has not as yet been determined, but it is probably through the capillaries.

The interesting appearances presented by these liver sections, which were kindly prepared for me by Mr. Richard Muir, of the Pathological Department, University of Edinburgh, and require detailed study, are further confirmation, if any were required, that this parasite of jerboas is a hæmogregarine.

Laveran[4] has pointed out that the schizont stage of these parasites in reptiles is passed in the liver, and Labbé has given much attention to this subject. I have not yet been able to decide whether dimorphism occurs, and if micro- and macromerozoites can be distinguished, but it is probable that such will be found to be the case.

Before seeing the liver sections I was under the impression that the non-sexual cycle was probably as follows: The trophozoite is set free from the erythrocyte as the travelling vermicule, which eventually penetrates a cell of the liver or kidney, and gives rise to schizonts in the form of cytocysts. In these the merozoites are formed which, after certain changes, eventually escape into the blood stream, invade red blood corpuscles and so restart the cycle of schizogony.

So far, however, one has not been able to see anything like the travelling vermicule in thel liver sections. The form invading the hepatic cells looks like the trophozoite of the peripheral blood, or, at the most, one of the swollen forms already mentioned. Is it, then, possible that the travelling vermicule plays no part in this cycle? This is possibly so, or again, as Labbé asserts, for *Lankesterella* and *Karyolysus*, an isogamic conjugation may take place between two of these free forms, and it may be the zygote so formed which can be seen penetrating the liver cells. Many, however, disbelieve Labbé's conclusions, which have not been confirmed by the observations of Hintze[5] on *Lankesterella*, so possibly the freed trophozoite directly invades the liver cell and becomes the schizont, while the free vermicule is intended to play a part in an extracorporeal sexual cycle. This leads us to consider the habits of the jerboa and the parasites which it harbours.

The rodent is a nocturnal animal, living in holes in the desert, remaining invisible throughout the day, but found hopping about in the evening and on moonlight nights. It exists far from any water, which it does not seem to require, and its food probably consists of the minute seeds of the small plants which contrive to exist in sandy wastes. The animal is easily caught in traps baited with millet.

Both fleas and mites are found on the jerboa. The species of *Siphanoptera* present has not been determined, but I have dissected and examined the internal organs of engorged fleas taken from infected animals. My observations have been limited, but, so far, though I have found unaltered parasites in the blood from the stomach of a flea, nothing has been seen which suggests that a stage is passed in that insect. Further dissections are required. Some blood containing endoglobular trophozoites was placed in the acid citrate solution devised by Rogers[6] to simulate the conditions present in an insect's stomach. Though kept in this medium for over forty-eight hours at room temperature, no change took place in the parasites, save that their cytoplasm became more granular.

I have not been able to examine the mites, which are extremely minute and not very often present. As the jerboa is nocturnal I thought it well to chloroform one during the night, and at once examine its blood and organs. I failed to find the vermicule form, or anything but the free and endoglobular trophozoites.

It should be said that to the naked eye there is no morbid appearance presented by any of the viscera. The spleen seems never to be enlarged, and, as far as can be told, the liver does not appear abnormal.

Further, it may be stated that numerous free forms (trophozoites or merozoites) are usually present in smears made from the liver, kidney and bone-marrow, and to a less extent in those from the spleen.

Professor Laveran writes me to say that he has now found the same parasite in jerboas from Tunis, so that, no doubt, much information will soon be forthcoming regarding this interesting parasite of mammals. It will be of special interest to determine if it really exists as a leucocytozoön in *Mus decumanus*, or whether in the case cited the mononuclear leucocytes were merely taking on a phagocytic action, or whether the parasite found in the Norway rat is another distinct variety.

In concluding this paper, I would record my sincere thanks to Professor Laveran for his kind interest and advice; my indebtedness to Dr. Beam, chemist to the laboratories, for the photomicrographs; to Mr. Muir for the drawing of the vermicule, and to my laboratory assistant, Mr. Friedrichs, for his useful aid in the work.

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List of Illustrations.

Fig. 1.—*Jaculus gordoni.* Soudan.
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Fig. 6.—Cytocysts empty and with merozoites in liver smear.
Fig. 7.—Small cytocyst with merozoites in liver smear.
Fig. 8.—Large cysts with bundle of merozoites in liver smear.

"Archive Gen. de Med.," July 4, 1905.

Sleeping Sickness. Sicardo Moutier.

At the Soc. Med. des Hopitaux, June 30th, a man of 38 was shown who had contracted trypanosomiasis two years before in Gambia, when he had headache, lassitude and general debility. The second stage of the disease was characterised by epileptiform crises with partial contractions, followed by torpor. The third period commenced eight months ago with deep sleep lasting eighteen to twenty-four out of the twenty-four. Lastly, there is fever, loss of control over bladder and rectum, with commencing bedsore. Lumbar puncture showed abundant lymphocytes, and the signs of marked meningeal infection. The history and physical signs negative the diagnosis of general paralysis, tumour, or syphilitic tubercular or malarial meningitis. Trypanosomes have not been found. Inoculations are too recent to show results.

T. P. B.

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THE

Journal of Tropical Medicine

AUGUST 15, 1905.

BRITISH MEDICAL ASSOCIATION ANNUAL MEETING, LEICESTER, 1905.

SECTION OF TROPICAL MEDICINE.

Being a complete Abstract of the whole Proceedings of the Section.

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THE NATURE OF HUMAN TICK FEVER IN THE EASTERN PART OF THE CONGO FREE STATE, WITH NOTES ON THE DISTRIBUTION AND BINOMICS OF THE TICK. By J. Everett Dutton, M.B.(Vict.), late Walter Myers Fellow of the Liverpool School of Tropical Medicine, and John L. Todd, M.D.(McGill).

Dutton and Todd, on November 26th, 1904, first intimated that a spirillum was the patho-

genic agent in the human tick fever which occurs in the Oriental province of the Congo Free State, and that they had been able to infect monkeys with spirilla through the bites of ticks. Natives in this part of Africa have always dreaded the bite of the tick, *Ornithodoros moubata*, and but little attention was paid to their statements until quite lately. Dutton and Todd have been able to show that tick fever in the Oriental province of the Orange Free State is a relapsing fever produced by a spirillum probably identical with *Spirochæte obermeieri*, and thus this organism can be transmitted by the bite of the tick *Ornithodoros moubata*. In one experiment also they succeeded in transmitting the spirillum by the bites of young ticks newly hatched in the laboratory from eggs laid by infected parents.

Incubation Period.—The time between the bite of the tick and the development of the disease is usually about one week.

Symptomatology.—The onset of the fever is sudden; no rigor has been noted. The pronounced symptoms are: marked prostration, headache, boneache, backache, distaste for food, vomiting at commencement of illness, slight diarrhœa common, constipation rare, temperature in the evening may reach 105·3° F. There are usually three or four attacks, which often end in profuse perspiration. As a rule, each attack lasts three or four days, with an interval of five to ten days. Enlargement of the spleen, herpes, epistaxis and hiccough have been observed. Sudden and deep prostration during the attack and speedy recovery are characteristic features of the disease.

Twelve cases of tick fever in natives are recorded and an account of the disease in two Europeans, one of which possesses a melancholy interest, inasmuch as the sufferer was the late Dr. Dutton himself.

The Disease in Experimental Animals.—Experiments indicate that the spirillum does not kill the ordinary laboratory animals. To monkeys (the *Cercopitheci*) alone does the spirillum seem uniformly pathogenic. Rats, a guinea-pig, rabbits, monkeys (5), were experimented upon, and in all seven monkeys and one rat were infected with spirilla by the bites of ticks.

The Spirillum.—When the parasites are numerous they are seen in fresh preparations of blood as rapidly moving spiral threads. Should the spirilla in the blood be scanty, thick dehæmoglobinised blood films may be stained by a modification of Romanowsky's method, or with a weak solution of carbol-fuchsin. Measurements show spirillum vary between 43 μ and 13 μ.

Distribution of the Tick.—Ticks are found along the much-travelled roads; the rest-houses, not only in the Congo but in Uganda, are particularly liable to be infected. In infected houses the ticks are found in the dust and cracks of mud-floors, in bed platforms, in grass walls and thatched roofs. The bite of even a small tick is painful; between the toes and in the axilla are favourite places for the tick to bite, but they may bite any part of the body. The female lays eggs to the number of seventy or more, the largest number found being 139; the eggs adhere to each other and appear, under the low power, like bunches of glistening, brown grapes. The shape is somewhat round and measures from 959·4 by 841·32 μ to 767·52 by 664·2 μ. Under favourable conditions of soil (sandy), temperature and humidity, the eggs hatch in about twenty days. In about seven days a hexapod larva can be seen within the translucent shell; at almost the thirteenth day the egg shell splits; ecdysis takes place, the nymph throws off the shell and larval cast together. The larvæ are inactive.

The conclusions are:—

(1) Tick fever is clinically identical with relapsing fever, and has for pathogenic agent a spirillum.

(2) The spirillum is probably *Spirochæte obermeieri.*

(3) The tick *Ornithodoros moubata* can transmit the spirillum from animal to animal.

(4) Transmission is probably mechanical, but some developmental process is carried on in the tick.

(5) A considerable degree of immunity or tolerance to the spirillum can probably be acquired.

Louis W. Sambon, M.D.(Naples), London, stated that Drs. Dutton and Todd had proved the presence of relapsing fever in the Congo Free State, and that the tick *Ornithodoros moubata* was the propagator of the disease. The descriptions of a disease on the Zambesi given by Livingstone, Kirk, Dowson and Daniels were of too scanty a nature to conclude that it was relapsing fever, although the natives do certainly attribute the disease to the bite of this tick. If the disease of "Tete" in the Zambesi is a spirillum fever, then most probably the disease of "Miana" met with in Northern Persia is of the same nature. Moreover, if spirillum fever is transmitted by ticks on the Congo, in Uganda and in Persia, it is probably also conveyed by blood-sucking insects or ticks in India and elsewhere. Dutton and Todd's observations tend to prove the correctness of the views of Tictin, who in 1897 attributed the relapsing fever in Odessa to the bite of the common bed-bug. The wide distribution of spirillum fever and the fact that the spirilla could be fostered by different species of ticks showed that we might expect to find the parasite represented by a number of more or less distinct varieties, or even species. In many parts of the world, in South and Central America, in the West Indies, in Australia, and in the Malay Archipelago, ticks are known to be injurious to man. In some places, as in Mexico for instance, it is probably a spirillosis that they transmit; however, it is possible also that other organisms besides spirilla might be fostered and transmitted by ticks, such, for instance, as piroplasmata.

The case of infection by means of ticks hatched in the laboratory from eggs laid by infected parents, that had not previously fed on man or animals suffering from spirillum fever, and related by Drs. Dutton and Todd, was not sufficiently exact to be conclusive; but Dr. Sambon considers this mode of transmission to be the ordinary mode of transmission with ticks. The observation made by Dutton, Todd and Newstead, that whilst the ticks are feeding a whitish secretion from the Malpighian tubes escapes by the anus is interesting, but Dr. Sambon states that a portion of this white excretory matter is produced within the cells of the ventriculus. These cells when the tick is engorged with blood change their shape, allow of the passage of the elaborated food into the body cavity, and finally when emptied fall into the lumen of the ventriculus, but the cells still retain a certain amount of excretory matter in the form of crystals or concretions.

Major Ronald Ross, C.B., F.R.C.S., drew attention to the minute tick which is met with in some parts of India, especially amongst sportsmen. It is not unusual to find twenty or thirty minute ticks fixed round the neck just above the collar; the tick would seem capable of biting human beings at any time of the day.

Dr. J. C. Graham mentioned that in Sumatra he had seen small ticks of a greenish hue bite man; they adhered to the skin with marked pertinacity, presenting considerable difficulty in removal.

Dr. Albert J. Chalmers stated that in Ceylon a tick termed the "red-hot tick" was met with; the parasite got its name from the acute pain caused by its bite.

On the Pathogenic Ticks Concerned in the Distribution of Disease in Man, with Special Reference to the Differential Characters in Ornithodoros moubata.

By R. Newstead, A.L.S., &c.

Lecturer in Economic Entomology and Parasitology, Liverpool School of Tropical Medicine, in the University of Liverpool.

The objects of the present paper is to briefly summarise the pathogenic ticks concerned in the distribution of disease in man, with special reference to the differential characters in the external anatomy of of *Ornithodoros moubata*, Murray, together with an account of its life-history.

The Systematic Position of the Ticks.

Ticks (*Ixodoidea*) belong to the class *Arachnoidæ* (spiders, mites, &c.), order *Acarina*. Thus, they are closely related to the mites which produce *Acariasis* in man and animals. This super-family is divided into two sub-families, the *Argasidæ* and the *Ixodidæ*. The former is composed of two genera, *Argas* and *Ornithodoros*, while the *Ixodidæ* comprises nine genera. The members of the first division are recognised by the absence of a dorsal scutum, and the capitulum is more or less hidden under the projecting anterior margin. In the second division the capitulum projects from the anterior margin of the cephalic area, forming a projecting beak-like prominence; and immediately behind the capitulum, on the dorsal area, is a large scutum or shield. The buccal organs are highly organised in all the members of the *Ixodoidea* and are composed of four distinct bilateral parts. When about to take food from its host the animal fastens itself firmly by its legs, depresses its rostrum, and implants the toothed mandibles, and in proportion as these penetrate the hypostome follows and the retrograde teeth on the surface fixes this organ in the wound. In this way the hypostome and the mandibles are driven into the wound to their full extent, and so firmly do they become fixed into the derma that it is often impossible to remove the tick without leaving the mouth organs attached to the host or tearing away a small portion of the skin.

A fully engorged tick acquires considerable size, and after fecundation invariably falls from its host. Egg-laying takes place shortly afterwards and the animal subsequently dies. The eggs are usually concealed beneath some object. The young larvæ, on hatching, swarm up the herbage, or, as in the case of the domestic species, over the floor of the native huts, seeking any convenient spot in which they can conceal themselves, only to sally forth in the dark to seek a new host.

Some species of ticks pass the whole of their lives, from the larva to the adult stage, on one host. Others have two hosts, and some species require three hosts, but the members of the genera *Ornithodoros* and *Argas* have an indefinite number of hosts and may live for several years.

The ticks concerned in the transmission of human diseases are three in number: *Argas persicus*, *Ornithodoros moubata*, and *Dermacentor reticulatus*.

(1) Of the Miana bug (*Argas persicus*) very little is known with regard to its injury to man, but it is said to be a terrible scourge to travellers both in Persia and Beluchistan. This species is also responsible for the transmission of the spirillosus of the domestic fowl, a disease which is very prevalent in South Africa and Australia, but it does not affect man in these regions.

(2) *Ornithodoros Moubata.*—In many respects the habits of this species are not unlike those of *Argas persicus*, but so far as I have been able to ascertain the inert character of the larva of *O. moubata* is unique among the *Ixodinæ*, in that it passes the whole of its life within the egg.

(3) *Dermacentor Recticulatus.*—This is the tick which Surgeon John F. Anderson thought to be responsible for the transmission of spotted fever or tick fever of the Rocky Mountains region in the United States of America. Anderson founded his theory on the grounds that the fever was always found where there was a history of tick-bites about one week before the outset. Claim not substantiated.

Observations on the Engorged Tick and Her Progeny.

The female became very restive after feeding and made repeated attempts to escape from the bright sunlight. She was put into a Petri dish on a deep layer of dry sand, in which she rapidly buried herself, and placed in a dry incubator at an even temperature of 29° C. After laying the first batch of eggs she was placed in a partly hollowed-out banana and enclosed in a cardboard box. The animal immediately left the banana, and took up a position in a broad groove where she was partly concealed, in which position she remained fixed, inert until long after the third batch of eggs were laid. No attention was paid to the banana; indeed, she made a hasty retreat from the fruit, and got as far away from it as the limits of her cage would permit. Here two more batches of eggs were laid, both lots being protected for a few days beneath the body of the parent, but both lots finally slipped from beneath her and fell intact to the bottom of the box. She defæcated three times during the period of egg-laying; the white fluid-like fæces when dry left a white deposit resembling French chalk in texture. The actual process of egg-laying was not observed. The length of the tick before feeding was 7 mm. The weight before feeding was ·0270 grms., after engorgement ·2602 grms., or an increase of about ten times her orginal weight. This was not a very marked increase, as compared with certain other species of female ticks, which are known to increase to about thirty times their original weight after engorgement. Batches of eggs were laid on the following dates during the night:—

June 29.—First batch of 17 eggs, these were found in a little cluster at the bottom of the Petri dish.

July 2.—Second batch of 51 eggs laid. These were protected for a few days beneath the body of the parent.

July 10.—Third batch of 26 eggs laid. These were also protected by the parent for a few days.

Bruhl's Disease, with Special Reference to the Blood Changes Found, and Connection with the Leishman-Donovan Bodies.

By P. W. Bassett-Smith.

Fleet Surgeon, R.N., Haslar.

At the Royal Naval Hospital, Haslar, two cases of splenic anæmia and Bruhl's disease came under treatment. Bassett-Smith took the opportunity of their presence there to test the question proposed by Dr. J. C. Low, of the London School of Tropical Medicine, whether the cases of so-called splenic anæmia were, or were not, associated with the presence of Leishman-Donovan bodies in the splenic blood. Both the men examined had been abroad and suffered from marked anæmia and splenomegaly. The blood drawn from the spleen by punctures gave negative results as to the presence of the Leishman-Donovan bodies, nor were there any signs of malarial infection.

The result of the examination would seem to indicate that splenic anæmia is not due to any parasite, but belongs to that class of cases which come under the term of primitive splenomegaly in contradistinction to the true tropical splenomegaly in which the Leishman-Donovan bodies play so important a part.

Notes on Two Cases of Febrile Tropical Splenomegaly (Kala-azar), and a Suggestion.

By Sir Patrick Manson, K.C.M.G., F.R.S.

Of the cases reported, Case I., was that of a man, aged 41, who had resided for nineteen years on the borders of Assam. He had mild continued fever three years ago. He came to England in 1904, returned to Bengal in July, and within a week or ten days after his return the present illness began. He continued to have fever at intervals, and on November 3rd, 1904, left India, reaching England December 5th, when he came to the Seamen's Hospital. Before he left India the liver and spleen were much enlarged. When admitted to the Seamen's Hospital the patient was well nourished, but weak; skin muddy; spleen firm, but not tender, enlarged, reaching 4 inches below costal margin; the liver was smooth, slightly tender and enlarged, extending 1 inch below costal margin in nipple line.

Leishman bodies were found on splenic and hepatic punctures. Arsenic was administered in increasing doses. From January 23rd to February 27th arsenic discontinued and X-rays tried, but without benefit; in fact, he lost weight after discontinuing arsenic. On March 2nd, arsenic and trypanroth hypodermically was commenced and continued until May 3rd, but without apparent benefit.

Case II. was that of a man, aged 22, born in India, educated in England, and went out to India two years before being taken ill. The symptoms on admission to hospital indicate kala-azar and the blood showed Leishman bodies, but not quite like the appearance these bodies usually present. The patient died of broncho-pneumonia on May 13th, 1905, having been ill since December 10th, 1904.

Leishman Bodies and Oriental Sore.

Sir Patrick Manson also drew attention to the question of the Leishman body and that found in

Oriental sore as an interesting pathological point. In tropical splenomegaly the Leishman body is found in the spleen, liver, bone-marrow, glands, intestinal ulcers, &c.; in Oriental sore it occurs only in the sore. In the former ailment marked constitutional disturbances occur; in the latter the infection is strictly localised, and there is no recorded constitutional disturbance, but it stands to reason that in Oriental sore there must be some constitutional recognition of its presence. In Baghad the Jews, dreading an attack of Oriental sore on the face, have for generations practised inoculation from the sore on some part of the trunk or limbs, so that the scar left by the sore may not cause unsightly facial disfigurement. They are tempted to perform the inoculation by the recognition of the fact that inoculation by and against the ailment is protective. Assuming, therefore, that the bodies met with in kala-azar and Oriental sore are identical, and that whereas the former is malignant whilst the latter is benign in its course, it follows that the malignity of the kala-azar germ has been got rid of in some way or other.

Oriental sore exists in countries in which the camel is known, and drivers of camels are especially liable to the disease. Manson believes, therefore, that Oriental sore stands to kala-azar as does vaccine to small-pox, and as small-pox loses its virulence when passed through the body of the cow, so may the bodies met with in kala-azar be modified by passing through the body of the camel, and give rise to a mere local manifestation of inoculation (Oriental sore) instead of the virulent form of the disease—kala-azar. If this is really the case, a means of preventing kala-azar at once presents itself.

Guinea-worm and its Hosts.

By W. M. Graham, M.B.

Medical Officer, West African Medical Service.

From observations made in 1904 at Gambaga in the hinterland of the Gold Coast Colony, Dr. Graham found that there is one month in the year, namely, June, during which the signs and symptoms of Guinea-worm infection attain their maximum. Assuming that the cyclops is the alternating host with man of the Guinea-worm, the induction appears legitimate that the month of maximum manifestation in man is the month of maximum infection of cyclops. Fedschenke showed that in Turkestan Guinea-worm embryos require five weeks for complete development in cyclops. Embryos, therefore, beginning this development in June would become capable of infecting man in July or August of the same year; and as the parasite acquired by man in July or August would become manifest by discharging embryos in the following May or June, it would seem that ten months represent roughly the period required by the Guinea-worm for its complete development in man. Allowing that the infection of the cyclops with Guinea-worm occurs during the months of May and June, are there natural facilities afforded to the process of infection at this time?

Dr. Graham essays to answer this question by an exact description of the water supply of the locality in which his observations were made. The villagers drew their water from three wells connected by channels, in which water flowed during certain months, and in certain months were dry. When the streams were full of water cyclops were found in the streams and not in the wells, but when the channels were dry the cyclops occurred in the wells and bred there. The natives stand in the wells during the dry season whilst drawing water; the embryos in their legs can then escape and infect the cyclops.

The prophylaxis of Guinea-worm infection would seem to consist of (1) careful filtration of the drinking water; a fine handkerchief will serve the purpose, as by this means cyclops can be readily removed; (2) prevention of infection of cyclops by providing troughs for the natives to draw water from, so that the cyclops is excluded.

W. Carnegie Brown, M.D. (formerly of) Penang, said that in the Straits Settlements Guinea-worm infection was not endemic, but amongst immigrants from the Coromandel coast of India, where the disease was endemic, to the Malay Peninsula excellent opportunities for studying several points in the life-history of the worm were afforded. He had seen a dracunculus abscess as late as eighteen months after the arrival of immigrants from India. He had observed no periodicity in the manifestation of the disease in the Straits Settlements, and although *Cyclops quadratus* was found in the streams and canals of the Malay Peninsula, the cyclops did not seem capable of developing their embryos, at least to a degree hurtful to man. Dr. Brown is of opinion that the embryos gain access to the human body by way of the skin, and whilst the patient is standing in water.

F. M. Sandwith, M.D., F.R.C.P., Cairo and London, corroborated Dr. Graham's remarks concerning the periodicity of Guinea-worm manifestations in man. In the Soudan human beings suffer from *Filaria medinensis* during two or three months of the year only. The point to investigate would seem to be whether or not the embryos can enter the skin of man without passing through any species of cyclops.

Louis W. Sambon, M.D., said that the greater incidence of Guinea-worm manifestation had long been known to take place in connection with the rainy season. Actual contact with water was necessary for the extrusion of the embryos, a fact which has been known to natives of Guinea-worm countries from time immemorial. The location of the parasite usually about the lower extremities was in correlation with this necessity and had nothing to do with its mode of entrance. Other parasites behaved in an analogous manner. The rediæ of *Fasciola hepatica* in dry seasons harboured within the liver of *Limnea truncatula*, did not give birth to free-living cercariæ but to a second generation of rediæ which remained in the host of their parent awaiting for more favourable meteorological conditions. In regard to penetration of the skin by Guinea-worm embryos, it must be remembered that other parasites such as *Strongyloides intestinalis* and certain trematodes are considered to do likewise. Errors in this belief are, however, likely to arise; the larvæ of warble-flies (*Hypoderma*) were believed to penetrate the skin of the cattle they infest; now it is known that the cattle whilst licking their coats convey the parasite to the alimentary

canal, where after penetrating the walls of the œsophagus they advance through the tissues to reach the region of the animal's back. Dr. Sambon doubted the infection of man by the immediate entrance of the young larvæ either through the skin or the alimentary canal, and although it had been shown the larvæ of *Filaria medinensis* entered the cyclops, the experiments to bring about infection through the ingestion of infected cyclops had proved negative. Possibly cyclops was not the real host, notwithstanding the fact that the nematode might attain a certain stage of development in its body. On the other hand, it may be only certain species of cyclops that serve as hosts; or it may be that a second intermediary host is necessary; or it is possible that there may be a free-living stage with or without subsequent encystment, as in *Fasciola hepatica*.

William T. Prout, M.B., C.M.G., Principal Medical Officer, Sierra Leone, stated that there was an enormous amount of inefficiency on the Gold Coast, due to Guinea-worm infection, but the disease is very rarely seen at Freetown; Sierra Leone not being an endemic area of Guinea-worm infection. The difference may lie in the water supply, for whereas on the Gold Coast the water is derived from pools and shallow wells, the Sierra Leone supply is derived from streams from the hills. This would support the theory that drinking water is the channel of infection in human beings.

J. Tertius Clarke, M.R.C.S., L.R.C.P., Perak, Malay States, said that in the Malay Peninsula the water supply outside of the towns is usually bad. Although the cyclops is prevalent, and although the Tamils bathe in and drink water all over the district, they do not acquire Guinea-worm disease.

T. A. Chalmers, M.D., Ceylon, noticed the periodicity of Guinea-worm manifestations at Accra on the West Coast of Africa. He had searched there for infected cyclops without finding them. He did not think authorities in tropical medicine understood the great amount of physical infirmity the Guinea-worm caused, and it would be well were the disease more carefully studied.

Dr. Claus Schilling, Berlin, stated that a colleague who had experience of Guinea-worm disease in Africa had shown that when the native soldiers under his charge were compelled to take their drinking water from sources other than that in which they bathe, the disease disappeared. This would support the opinion that the infecting germ entered by the alimentary canal.

Tropical Diseases of the Skin.

By J. M. H. MacLeod, M.D., M.R.C.P.

Lecturer on Skin Diseases, London School of Tropical Medicine.

Dr. MacLeod opened the discussion on tropical diseases of the skin by regretting the absence of Prof. Jeanselme, of Paris. Dr. MacLeod approached the subject by arranging the tropical diseases of the skin into four groups:—

I. Parasitic Diseases due to some Known Parasite.—(*a*) Diseases due to Bacteria. In warm, as in temperate climates, tuberculous cutis affections are common and multiform; lupus vulgaris seems, however, rarer in tropical climates than elsewhere. Leprosy flourishes, at any rate at the present day, in tropical rather than in temperate climates, but the cause of the prevalence may have nothing to do directly with temperature. Removal of lepers to a non-leprous country would seem to be beneficial, and the explanation remains to be elucidated.

(*b*) Diseases due to Streptothrix. Madura foot is one of the best-known examples of a streptothrix invasion of the skin. The white variety of the disease is fairly well understood, but the black variety, which Kanthack regards as a degenerative form of the white, and Oppenheim declares to be due to an oidium, requires further study.

(*c*) Diseases due to Blastomycetes (Yeasts). Moist and warm climates are especially favourable to the growth of yeasts in the skin. Recently a skin affection resembling lupus vulgaris has been described in America, from which a yeast has been recovered; the name blastomycetes dermatitis has been given to this affection, which has proved fatal in some cases. In California and Buenos Ayres, a yeast has been discovered in similar cases, and the name *Dermatitis coccidoides* bestowed upon it.

(*d*) Diseases caused by Hyphomycetes or Moulds. Of these ringworm is the most important, the best-known variety being tinea imbricata, but the precise nature of the mould which causes it is still under dispute. Trebondeau considers it an aspergillus; Tabourand maintains it is a trichophyton, the opinion which obtains most favour. Pinta, another hyphomycetic disease, is ascribed to a variety of fungi, Penicillium, Aspergillus, Monilia, and Trichophyton.

(*e*) Animal Parasites. The best known is, of course, scabies, which is found in every clime. Pani-ghao or ground-itch—the sore feet of Assam—has also been ascribed to an Acarus, but recently it has been attributed to the penetration of the skin of the lower limb by the larvæ of ankylostoma. Elephantiasis arabum is attributed to the blocking of the lymph channels by the immature ova of the *Filaria bancrofti*, but this explanation is unsatisfactory. It would appear that some other unknown agent is at work in the production of elephantiasis. In Europe we are familiar with localised elephantiasis, believed to be due to streptococcic infection, associated with recurrent attacks of local erysipelas, giving rise to permanent inflammatory changes in the affected tissues, the lymphatic obstruction being secondary to the vascular changes.

II. Diseases in which there is Strong Evidence of a Parasitic Origin, but in which a Specific Micro-organism has not yet been Established.—Oriental sore, known under various names—Delhi boil, Biskra button, Bagdad sore, &c. — comes under this heading. Many micro-organisms have been described as causative of this affection, but lately the disease has gained prominence from the fact that an organism resembling Leishman bodies has been found to be present in these sores. The veld sore, which during recent years we have become familiar with among the soldiers in the South African campaign, has been shown by Bishop-Harmann to be due to a diplococcus—the *Micrococcus vesicans*. The phagedænic ulcer of warm countries is probably due to an undetermined form of bacterium. Pemphigus contagiosus seems to correspond with pemphigus acutus or P. neonatorum of temperate climates. Keloid is particularly common in black

and yellow races, and possibly results from inoculation of wounds by some micro-organism. Yaws (frambœsia) and its relation to syphilis has occupied attention for some time. Ulcerating granuloma of the pudenda has a widespread geographical distribution, but the specific organism, if there is one, has not been isolated.

III. Diseases in which Micro-organisms are generally Present, but are probably Secondary Factors in the Evolution of the Disease.—Prickly heat and Dysidrosis are the two ailments which stand out most prominently in this connection. Prickly heat, in all probability, is associated with some harmless microbe, as the eruption seems to occur independently of the sweat glands themselves. Dysidrosis or cheiro-pompholyx is closely allied to prickly heat, but affects the hands and feet more particularly. The disease seems independent of the sweat glands, and is frequently associated with an eczematous condition about the crutch and umbilicus, suggesting the presence of a micro-organism of low virulence.

IV. Non-parasitic Skin Affections of the Tropics.—Pellagra, acrodynia, ainhum, pigmentation and vitiligo are referrible to this group of skin affections met with in warm countries.

Pinta.

By F. M. Sandwith, M.D., F.R.C.P.

Consulting Physician, Kasr-el-Ainy Hospital, Cairo; Lecturer at the London School of Tropical Medicine.

Pinta, or spotted sickness, is a tropical disease caused by a fungus which produces discolourations of various kinds on the uncovered parts of the skin, and sometimes on the mucous membranes. Dirt and poverty seem to be predisposing agents. Both sexes are liable to the disease, and although persons between fifteen and twenty-five years of age are most liable to the disease, all ages may be attacked. Pinta is not hereditary, nor is it contagious. Mosquitoes, fleas, or bugs may serve to introduce the disease, which has been communicated to rabbits by inoculation. Nine varieties of the fungus exist, and some shade of violet seems the prevalent colour met with, but white, red, and yellow colours are also described. The eruption may begin on the face, nape of the neck, cheeks, nose, forehead, ears, and later may appear on the forearms, wrist, legs, ankles, and exposed part of the chest. The eruption is usually not symmetrical, and is accompanied by furfuraceous desquamation. The course of the disease may be divided into two stages: the first in which active increase of pigment occurs, the second characterised by disappearance of pigment and pseudo-vitiligo.

The disease may last twenty to forty years, and is considered incurable unless treated. The fungus—*Trichophyton pictor* (Blanchard)—consists of round or oval spores from 8 to 12μ in diameter, and of tapering branched mycelial threads to which the conidia are attached. The diseases with which pinta may be confounded are leucoderma (vitiligo), leprosy, pityriasis versicolor, lupus erythematosis, and the scars of favus. The treatment consists in applying tincture of iodine or Vleminckx's solution to the spots early in the disease; when the discolourations have lasted some time, chrysarobin ointment, or nitrate of mercury ointment may be tried. Patient's clothing and bedding should be sterilised, and bodily cleanliness insisted upon.

The Geographical Distribution and Etiology of Pellagra.

By Louis W. Sambon, M.D. (Naples),

Lecturer to the London School of Tropical Medicine.

Dr. Sambon said he believed pellagra to be far more common in tropical and subtropical regions than we know at present. Undoubtedly pellagra was still unrecognised in many of its endemic areas, its nervous symptoms, gastric derangements and skin lesions being ascribed to other and separate diseases. There was no cause for surprise in this. The recognition of pellagra was not always an easy matter for those who were not familiar with its symptoms and course. A parallel and instructive example was that of kala-azar, a disease which was believed to be confined to the Assam valley until the discovery of its specific agent showed that it dad a very wide distribution not only in India, but throughout the tropical world.

Pellagra was first accurately described by Gaspar Casal, in 1750, under the name of *Mal de la rosa*. In Spain and Italy the disease had been known for over a century and a half. In 1818 it was discovered in France; in 1833 in Roumania; in 1839 in the Island of Corfu. More recently other endemic centres had been found in Portugal, in Tyrol, in Dalmatia, in Croatia, in Bosnia, in Turkey, in Greece, in Bessarabia and in Kherson. In Africa, pellagra was first recognised in 1847, by Pruner, who had studied the disease in Italy. Sandwith had recently found it to be very prevalent in Lower Egypt, less so in Upper Egypt. The disease had also been seen in Algeria, on the coast of the Red Sea, and amongst the Kaffirs and Zulus. From Asia we had no definite information, but Dr. Ray and others had noticed skin lesions similar to those of pellagra in India. In America, pellagra had been recognised in Mexico, in Brazil, and in the Argentine Republic. Dr. Low, who had had the opportunity of seeing cases of pellagra in Italy, thought that he had recognised the disease in the West Indies, and a further enquiry had convinced Dr. Sambon that pellagra was not uncommon in Barbadoes and other West Indian Islands. Finally, Dr. Neiret had reported it from New Caledonia.

Considering the wide geographical reach and grave importance of the disease it was urgent that medical men should learn to recognise it. In Italy pellagra was rightly considered one of the worst disease scourges of the country. About 100,000 cases were known, and the disease was dreaded, not so much on account of its deadliness, but because of the indescribable wretchedness and suffering to which it gave rise during its slow, cruel course of many years. The disease was characterised by an erythema affecting the unclothed parts of the body most exposed to the sun, recurring each spring and leaving behind a peculiar roughness and pigmentation of the skin which gave rise to the Italian name pellagra, meaning rough skin. In its later stages it is characterised by progressive weakness, great emaciation, and by severe melancholia alternating with maniacal phases. The disease presents, moreover, very marked gastro-intestinal symptoms, the

tongue and palate lose their epithelium, and diarrhœa is frequent, becoming unrestrainable towards the end.

Pellagra had been attributed to insolation, to bad water, to insanitary dwellings, to poverty, to the use of irritant oils in the preparation of food, to onions, garlic and maize. Most of these theories had been abandoned and therefore needed no discussion, but the maize theory called for a very serious scrutiny because it was almost unanimously accepted. At first it was believed that maize lacked in nutritive principles, later it was surmised that it contained normally some toxic substance, finally, it was agreed to ascribe the disease not to normal maize, but to diseased maize, some incriminating certain toxic substances developed in the course of the decomposition of the grain under the influence of vegetable organisms, others incriminating the organisms themselves. Consequently the various fungi and bacteria affecting maize were all in turn made responsible for the causation of pellagra.

In describing the numerous researches, Dr. Sambon pointed out that each investigator had claimed to have reproduced true pellagra in animals and sometimes even in man, by the administration or inoculation of the special poison or organism which he had isolated. It was evident, therefore, that these experiments had no better value than those by means of which Klebs and Tommasi Crudeli had sought to prove that their famous bacillus was the real cause of malaria.

The most recent investigations were those of Dr. Petri, Ceni and Besta, who incriminated certain varieties of *Aspergillus* and *Penicillium*, but their experiments were by no means convincing. The organisms they incriminated were amongst our most common fungi; they could be found not only in diseased bread, but on the most heterogeneous media, such as fruit, cloth, jam and old boots.

He did not believe in the current maize theories of pellagra any more than he believed in the various rice theories of beri-beri, but he was quite prepared to believe that like the swamp in malaria, so maize and rice might represent necessary ækological factors in the natural history of the disease with which they had been so long associated in popular belief. So far, however, no conclusive evidence had been adduced in favour of the maize theory of pellagra. The maize theory of pellagra was chiefly an Italian theory. It had never found much favour in Spain, one of the principal seats of pellagra endemicity, where the disease was to this day regarded as a true *morbus miseriæ*. It had been frequently pointed out that the endemic areas of pellagra and the areas of maize culture were by no means overlapping, and, indeed, vast areas of maize cultivation had no pellagra, as, for example, the United States of America. On the other hand, pellagra had been observed in places in which maize was not cultivated and in people who had never used it as an article of food. To overcome these embarrassing obstacles to the maize theory, the ingenious term "pseudo-pellagra" had been invented. The disease therefore was pellagra only when it could be connected with a maize diet, in every other case it was nothing more nor less than "pseudo-pellagra."

A comparative study of the distribution and prevalence of pellagra at different periods was decidedly unfavourable to the maize theory. In the days of Casal, the province of Oviedo, in Spain, was one of the chief centres of pellagra. In 1900 it was the province which suffered least from this cause, whilst the highest incidence of the disease fell on the province of Madrid. Now, no change whatsoever has taken place in the maize cultivation of the province of Oviedo; the people there eat maize just as much as before, and no improvement has ever been adopted in the storage or preparation of maize. On the other hand, maize is hardly ever used as an article of food in the province of Madrid.

No less striking are the facts afforded by the spread of the disease in Italy. Pellagra is still very prevalent in the north of Italy, where maize forms the staple food of the peasants, but in recent years the disease has become far more prevalent in Umbria and in the Marche, and it has invaded the provinces of Siena and Grosseto in Tuscany, those of Campobasso, Teramo, and Aquila in the Abruzzi, and Molise, in which maize does not represent a principal article of food. It has also invaded the Campania, the Puglie, Sicily, and Sardinia, thus proving that it has a tendency to spread slowly but widely, and independently of maize cultivation.

When once established in a region, pellagra was very permanent, but its prevalence varied considerably from year to year, not always in direct connection with the amount of rainfall as has been erroneously asserted, but in connection with other ækological conditions as yet undetermined.

Dr. Sambon questioned the general belief that pellagra had appeared soon after the introduction of maize into Europe, and that it had advanced *pari passu* with the extension of maize cultivation and the adoption of the new cereal as an article of food. He pointed out that the disease did not attack indiscriminately all those who partook plentifully of maize, but only the field labourer. The poor who lived in towns and who fed exactly in the same way were not attacked. Towns in the very heart of intensely pellagrous areas showed that same remarkable immunity to pellagra that towns in malarious regions showed to malaria. Possibly, therefore, it was in the maize-field that the field labourer contracted the disease. Another important fact to consider was the age incidency of the disease. Pellagra was chiefly a disease of middle age. The majority of cases occurred between 20 and 50 years of age. If maize or bad maize were the cause of the disease, children would be the principal sufferers. This was so in the case of ergotism.

Pellagra did not attack all the members of a family at approximately the same time, as would be the case if the disease were due to some toxic food partaken equally by all. Pellagra exhibited a marked seasonal incidence, and in those who had contracted the disease there occurred a peculiar recrudescency of all the symptoms each successive spring. These facts were incompatible with the maize theory. The characteristic erythema of the disease reappeared constantly every spring in chronic pellagrous lunatics secluded in asylums in which maize was never an article of food.

Dr. Sambon said the unquestioning acceptancy of the maize theory was regrettable. The Italian Govern-

ment was spending considerable sums of money for the elucidation and eradication of the disease, but the investigations were limited to a study of the fauna and flora of stored maize. The Prefects of the various provinces attacked by the disease were directed to collect specimens of diseased maize and forward them to the laboratories of the Government Board of Health in Rome, where they were examined and experimented with. He regretted that the disease was not more fully investigated in the field by competent men and independently of any theory. If he were asked to suggest a theory, merely as a working hypothesis, he would be inclined to draw attention to the many analogies between pellagra and some of the protozoal diseases which had been recently worked out. But his reason for bringing the subject before the meeting was not to propound a new theory of pellagra, but to urge the necessity of a thorough investigation of this widely distributed and important disease.

A Communication on a Tropical Skin Disease.

By John Bell, M.R.C.S., M.R.C.P.
Superintendent, Civil Hospital, Hong Kong.

An Indian policeman who had resided nine years in Hong Kong was the subject of a sore on the sole of the right foot, which he ascribed to treading on a nail when walking barefoot. The sore increased to the size of the palm of the hand, circular in shape, with undermined edges, and with a red and irritable centre. Dr. Wm. Hunter found a parasite—*Rhizoglyphus parasiticus*—in the scrapings sent him for examination. This parasite is figured in Max Braun's "*Thierischen Parasiten des menchen.*" The sore healed after treatment with 4 per cent. formalin in glycerine.

Notes on Frambœsia Tropica (Yaws).

By J. Campbell Graham, M.D.
Deli, Sumatra.

Two cases of frambœsia were met with in Europeans by Dr. Graham whilst engaged in practice in Deli, Sumatra. One of the patients was a Dutch girl, aged 4, and the other a German girl, aged 6. In the former case the lesion was observed on the thumb of the left hand, the supracondyloid gland in the arm became enlarged, and the child looked cachetic. The child's Javanese nurse was found to have a patch of yaws on the breast. In spite of treatment the patient did not improve, until sent for a change to the hills in Penang, and was not quite cured until sent to Europe. The second case was also communicated by a Javanese nurse, the eruption was fairly widely spread, and the child did not completely recover until sent to Europe. Dr. Graham remarked that yaws is common amongst Javanese. If treated with potassium iodide or mercury internally and local applications of sulphate of copper the disease gradually disappears, but it may return after a year or two. Europeans do not recover from yaws as quickly as do natives. Tamils rarely take the disease in Java, and Dr. Graham has never seen a case of yaws in Chinese. He had lately met with success in the treatment of yaws by giving bicarbonate of soda internally, combined with sulphate of copper applications externally.

Notes on Pian (Yaws).

By M. E. Jeanselme, M.D.
Professor, Faculty of Medicine, Paris.

In Cambodia, where the disease is widespread, Jeanselme had an opportunity of studying yaws. He cannot accept Jonathan Hutchinson's suggestion that yaws and syphilis are identical diseases, because in the same part of the world, and among natives of the same race, the two toxins are found simultaneously, each, however, keeping its distinct characters. Charlouis, by inoculating with syphilis an individual who was already suffering from yaws, would appear to have proved the duality of the diseases. Again, although the two diseases are curable by the same drugs, it must be remembered that actinomyces is also cured by iodide of potassium. The prognosis of yaws is favourable as a rule, but it is unfavourable in cases of chronic ulceration, of progressive serpiginous invasion of healthy skin, and where the tissues are undermined as far as the ligaments and bones. Yaws is a highly contagious disease; in Cambodia and Laos it is quite common to see an infant being suckled by a woman whose breasts are covered by yaws. It is possible that infection is caused by insects, as the children, up to four or five, are naked, and their skins are the seat of bites and scratches. In some districts parents anticipate the inevitable attacks of yaws by favouring inoculation in every possible way. The disease is not hereditary. During the first three months of the disease the natives of Cambodia avoid all drugs, but subsequently the patients are subjected to fumigations of mercury while wrapped in mosquito nets. Iodide of potassium in anti-syphilitic doses has a good effect on yaws in two or three months, but whatever the treatment, the disease is apt to recur.

Papers.

By Aldo Castellani, M.D.
Colombo, Ceylon.

I.—Tropical Forms of Pityriasis Versicolor.

In Ceylon two types of pityriasis are met with. (*a*) Pityriasis nigra. In this type the affected parts are black and lustreless; the patches are usually round and desquamating, of various dimensions, and may be found on any part of the body except the face. The fungus shows mycelial threads 18 to 20 μ by $2\frac{1}{2}$ μ; non-branching, and at times irregular in outline, bent, banana-shaped, &c. The spores, frequently seen in clusters, are globular and measure from 5 to $7\frac{1}{2}$ μ. (*b*) Pityriasis versicolor flava. Of this type there are two varieties. One variety attacks the face, neck and upper part of trunk; the patches are yellow, smooth, presenting no desquamation, no itching, and are very difficult to cure. The second variety is generally seen in the arms and legs, the patches are light yellow or nearly white, elevated somewhat, present some desquamation, and are readily cured by the ordinary anti-parasitic remedies. It is not uncommon to find the different types of pityriasis versicolor, nigra and flava on the same individual.

In pityriasis versicolor flava of the first variety the fungus is scanty, the mycelium is thick and irregular in shape, the spores are few and do not run into clusters. In the second variety the mycelium is thin and regular in outline, spores small, oval, and numerous, and may be in clusters.

II.—Observations on Dhobie Itch and other Tropical Trichophytic Diseases.

Castellani, in his investigations of ringworm in Ceylon, has used the ordinary methods, viz., microscopical examination of scales and hair in liquor potassii, staining by various methods, the best being Morris's method modified by Walker, and a maltose agar culture medium. "Dhobie itch" is a term loosely used in the Tropics and denotes almost every known pruriginous skin affection. The fungus found in dhobie itch presents very few mycelial tubes and spores, mycelium segments are almost straight and present a double contour, some branching is observable; spores are oval or rounded and not large; greyish colours, slightly crateriform in shape, developed slowly in maltose agar. The fungus of dhobie itch is a trichophyton of different type to that met with in tinea circinata. The groins, inside of thighs, axillæ and submammary regions are the parts usually attacked by dhobie itch, but tinea circinata affects as a rule the trunk and limbs. The fungus of tinea circinata differs not only from that of dhobie itch, but the Ceylon variety is distinct in many ways from that met with in Europe. The fungus of tinea grows well in cultures producing large acuminated, snow-white, non-powdered colonies; the fungus evidently belongs to the megalosporon type.

Castellani has seen a case of mixed infection of dhobie itch and tinea circinata. Tinea imbricata, caused by the *Trichophyton mansoni*, has not apparently been met with hitherto in Ceylon, but the case of a Ceylon Tamil coolie investigated by Castellani presented symptoms suggesting tinea imbricata.

Ringworm of the scalp is not markedly prevalent in Ceylon, but Castellani has examined three native children suffering from the complaint. The fungus he cultivated from these cases was an example of the megalosporon endothrix type; so far Castellani has not found the *Trichophyton microsporon* (Andouini) in Ceylon.

III.—On the Presence of Spirochætæ in Two Cases of Ulcerated Parangi (Yaws).

Castellani, whilst examining some films from the secretion of a yaws ulcer in February, 1904, noticed several minute and almost invisible spirochæte-like bodies. Since, however, Schaudinn's discovery of a spirochæte in syphilis, the fact that a similar body is present in yaws ulcers attains an importance of great interest, for the well-known contention that clinically yaws and syphilis are allies is brought prominently forward. Of four cases investigated by Castellani two were of the dry yaws stage of the disease and gave negative results, but in the other two cases in the second stage of the disease spirochætæ were plentiful. The spirochætæ found were mixed with numbers of bacteria, stained by the Leishman alcoholic solution for five minutes to which distilled water is then added and allowed to stand for fifteen minutes the spirochætæ of yaws are found to take on a purplish, occasionally a bluish, tint. The organisms measure from 10 to 20 μ in length, pointed at both ends, and present a variable number of waves. Two types seem to exist, one with numerous small waves, the other with fewer, larger and more graceful waves. Castellani, in publishing these details, does not wish in any way to positively assert that the spirochæte stands to yaws in the relation of cause and effect.

Involvement of the Scalp in Leprosy.

By George Pernet, M.R.C.S., L.R.C.P.

Assistant to the Skin Department, University College Hospital, London.

Pernet has seen two cases of leprosy in which the hairy scalp was involved. This is a refutation of the statement generally made that leprosy does not affect the hair of the head. One patient was a native of Bombay who presented himself in 1898 at University College Hospital with nodular leprosy; the other was a patient of Dr. Radcliffe Crocker's, who described the case in the *Lancet*, vol. ii., 1896, p. 364. This woman was also the subject of nodular leprosy. Pernet remarks that he had seen lupus vulgaris attack the scalp in three patients.

Discussion on Papers on Skin Diseases.

H. Radcliffe Crocker, M.D., London, discussed the pathology of elephantiasis arabum and compared it with the cases of elephantiasis met with in this country. The pathology of elephantiasis arabum he did not consider in any satisfactorily explained by the mere obstruction of lymphatics by immature filaria ova. In cases of ringworm the clinical symptoms in most parts of the world seemed in almost complete resemblance, but the type of parasitic infection appeared to vary somewhat. Dr. Crocker had seen a case of granuloma in the groin of a negro who lived in London and had not been in a tropical climate for several years.

Professor Rubert W. Boyce, F.R.S., Liverpool (President), stated that the presence of filaria in the blood does not explain the fibrous changes which are so prominent a feature of elephantiasis. Local elephantiasis in this country seemed to be due to streptococcal infection, and possibly the same factor played a prominent part in elephantiasis arabum.

Major G. H. Fink, I.M.S., London, said that Oriental sore is known under several names in India; in some districts it was known as aurangzebe, because according to tradition the Emperor Aurangzebe suffered from and he became thereby immune to malarial fever. This idea of protection from malaria in those who had contracted Oriental sore was a common belief in parts of India. Major Fink had examined sandflies found in human habitations and found some of them teeming with flagellated organisms; the bites caused by these sandflies when irritated by scratching and otherwise often formed sores which were apt by inexperienced observers to be mistaken for a "specific sore." Major Fink showed photomicrographs of sandflies, and in one photograph flagellated organisms like parasitic cercomonas were apparent.

F. M. Sandwith, M.D., referring to Dr. Sambon's paper on pellagra, said that he did not consider weevils

to be the direct cause of pellagra in man, although it is true that weevils and mould often infect the maize side by side. The weevil penetrating the husk of the grain to form a hole in which to lay her eggs may carry into the grain any spores of fungi there may be on the surface. In this way the fungi might be conveyed to man by the food.

James Cantlie, M.B., London, said that amongst the skin ailments mentioned by the several speakers, he had seen no reference to a patchy pigmentation of the skin of the face, neck, and hands frequently met with in tropical countries, especially amongst women. He had bestowed the name "tropical mask" on this condition, which was a pure pigmentation not due to any parasitic infection, but resembled more closely the pigmentation seen in pregnant women in temperate climates. He had lately shown a case of this nature to Dr. MacLeod, and he also agreed that the condition was non-parasitic. Mr. Cantlie mentioned a case in which the "tropical mask" had led to mistaken diagnosis; a medical man in this country, unfamiliar with the condition, had informed the patient's friends that the pigmentation of the skin in a patient he was treating for intestinal flux was due to Addison's disease, and that all treatment was unavailable. Mr. Cantlie also stated that he had seen small sores on different parts of the body, resembling Oriental sores, in an officer just returned from Thibet.

D. E. Anderson, M.D., Paris, also took part in the discussion.

Karl Grossman, M.D., Liverpool, gave a lantern slide demonstration of coloured photographs he had taken of lepers in Iceland.

Discussion on Sprue and Hill Diarrhœa.

Sprue.

By James Cantlie, M.B., F.R.C.S.
Lecturer, London School of Tropical Medicine.

Since the discussion on sprue held five years ago in the Section of Tropical Diseases it cannot be said our knowledge of the disease has advanced to any marked extent. Many observers had patiently sought for an intestinal organism in the stools of sprue patients, but all results have proved negative to indicate the etiology of the disease; this does not, however, prove the absence of a specific organism in sprue. Mr. Cantlie is inclined to regard liability to sprue to arise primarily from a physiological atrophy of certain of the digestive organs due to the prolonged residence in a hot climate. The organ which clinically shows most alteration is the liver; and in all sprue patients the liver is markedly reduced in bulk. Owing to the loss of functional activity in the liver the contents of the bowel are improperly digested, abnormal organisms develop in the bowels, causing a continuance of the intestinal flux. The frothy, bulky stools indicate a fermentative change, and their pale colour point to the absence of healthy bile. Stomatitis is a common ailment amongst adults, especially women, in South China; an attack from its initiation to its complete disappearance lasts three weeks, and there may be as many as three or four attacks during twelve months. Sprue does not necessarily follow upon these attacks, but they precede the disease, and are a warning that the disease may supervene. Mr. Cantlie is inclined to ascribe stomatitis and the subacute or acute gastro-intestinal indigestion which accompanies it to the use of coarse native oils instead of butter or fat in cooking food. He had only met with sprue in Europeans in South China. In regard to treatment he condemned the milk-treatment of sprue. Milk produced a stool which was solid in a sense, but it was not fæcal. The milk in its passage through the body became separated into curd and whey; the whey was absorbed but the curd was excreted, and gave the apparently solid motion which had neither the appearance nor smell of fæces, and was merely a cheesy mass, the result of precipitation of the solid matters of the milk—fæcal cheese, in fact. Mr. Cantlie had advocated meat-treatment for sprue when the disease was discussed at this Section (Tropical) some five years ago, and since then he had gained fresh experience of its efficiency. If the patient is very weak, meat juice, raw or warmed, might have to be given every five or ten minutes. After a day or so the intervals of feeding are increased, and beef jelly, calves' foot jelly, or plain jelly added. In some four or five days beef (3 to 5 ozs.) pounded in a pestle and mortar, and lightly cooked, could be given thrice daily, in addition to the above. Tea, China tea, held in a strainer above a cup and boiling water poured over it, is the best drink; rice tea, rice roasted in the oven until brown and infused by pouring boiling water upon it (2 tablespoonfuls rice to 1 pint water), is also an agreeable and useful drink. Wet packs (warm at first) applied to the abdomen for two hours, twice daily, are beneficial, accompanied by rest in bed. After a week the patient should be able to eat finely minced beef with or without a poached egg, and a cut of fresh meat from the joint can be given a few days later. Baked bread may be added after the fifth or sixth day, and vegetables such as vegetable marrow, stewed sea-kale, or stewed celery (young), may be added after a week's treatment. The meat-treatment took as many days to cure as the milk took months. Moreover, milk cannot cure, it can merely ameliorate the symptoms, for until the patient can eat ordinary diet he is not cured; stopping diarrhœa is not curing the patient. Of drugs, santonin in the preliminary stages and small doses of castor oil occasionally alone seem to aid the case. Mr. Cantlie had lately seen a case of true sprue develop in a man aged 60, who had lived in England for seven years, continuously, after leaving China. He had lately by meat-treatment treated two patients over 60 years of age successfully. A mixed diet of milk and meat was the worst form of alimentation in sprue. Strawberries (3 or 4 lbs. daily) combined with meat is more efficient than meat alone. Other fruits will no doubt be found to take the place of strawberries in the treatment of sprue, but at present none are known. No doubt sprue is scorbutic in its nature, and fresh meats, fresh fruits, fresh vegetables, are potent agents in the cure of the disease.

Hill Diarrhœa.

By Andrew Duncan, M.D., B.S.Lond., F.R.C.S., M.R.C.P.
Lecturer on Tropical Medicine at the London School of Tropical Medicine and the Westminster Hospital Medical School.

In hill diarrhœa the patient is attacked with a usually painless, but occasionally painful, purging, which sets in some time between 3 and 5 a.m. The motion

is copious, liquid, watery or pasty, and has been well compared to recently stirred whitewash. From one to six motions are passed up to about 11 a.m., when the purging ceases. There is great concomitant flatulence. During the remainder of the day the patient is free from the affection; but it recurs the next day, and so on, until liquid stools commence to appear in the evening. The patient at first thinks but lightly of the affection, but as it advances appetite is lost, the tongue becomes more furred, and now he feels faint after the stools. The latter increase in frequency, and emaciation sets in, until, if unchecked, death occurs from exhaustion. As regards the excreta, no bile is found in the stools; the urine is usually natural throughout.

As regards the etiology of hill diarrhœa, Colonel Crombie, I.M.S., holds that it is due "to the presence in the digestive tract of some organism which multiples there, devours the colouring matter of the bile, and perhaps other constituents, and so allows of rapid fermentative changes in the intestinal contents."

Lieut.-Colonel Dyson, I.M.S., points out that hill diarrhœa occurs in those hill resorts where the geological formation contains schist. In hill stations resting on sandstone, he says, the disease does not occur. The mica suspended in the water in districts where schist obtains causes a gastro-intestinal irritation, which results in hill diarrhœa. At Darjeeling the disease disappeared after the drinking water was carefully filtered. Dyson's theory seems to offer the best explanation so far of hill diarrhœa. Elevation does not seem to be a factor in the production of the disease, as in other mountainous districts of the world the complaint does not exist. Hill diarrhœa and sprue seem in no way related.

Treatment.—Colonel Crombie advises the method originally brought forward by Macpherson and Bary, viz., in *mild* cases: 12-15 grains of pepsin, ingluvin or lactopeptin are given two hours after food, which must be of milk. In *severe* cases, 5 ozs. of peptonised milk are given every two hours day and night, and also drachm doses of liquor hydrargyri perchloridi fifteen minutes after a meal. This will, as a rule, arrest the disease in three days, but some days must elapse before the colour in the motions is restored. There should also be absolute rest in bed. If, however, in spite of all treatment, the disease persists, the patient must take leave to England.

The subjects of Sprue and Hill Diarrhœa were discussed by:—

L. W. Sambon, M.D., considered that in sprue everything pointed to the presence of a specific micro-organism. The fact that sprue might develop in persons who had left the Tropics for a considerable time was not against the idea of a specific germ being the etiological factor. Blackwater fever, sleeping sickness, hydrophobia, leprosy and many other diseases might likewise manifest themselves for the first time in Europe several months or even years after their respective endemic areas had been left. The length of the period of incubation or latency depended on various causes in the different cases. The most important factors were numerical strength and virulence of the parasite, resisting power of the host, location of the parasite, transference from one anatomical region to another, and above all, association with other organisms.

David J. Galloway, M.D., Singapore, agreed with Dr. Sambon that sprue seemed to be due to a micro-organism. He could instance cases in which members of a family seemed to infect each other with sprue. He objected to the term "sore tongue," as the tongue is frequently affected without pain. Anæmia was a marked feature of sprue, the red blood corpuscle count being as low as 1,500,000 at times, whilst the hæmoglobin remained high. He considered milk useful in sprue, and thought that the no-drug treatment of the disease was overdone. Intestinal antiseptics were useful, and calomel, given according to Bouchard's plan, most efficient. Dr. Galloway also described several subsidiary symptoms of sprue amongst other hyper-peristalsis.

F. O. Stedman, M.D., Hong Kong, regards milk as a valuable agent in the treatment of sprue, especially when some intestinal antiseptic such as beta-naphthol was combined with the milk treatment. In regard to hill diarrhœa and its relation to mica in the drinking water, he had observed in Hong Kong that after the first heavy rains diarrhœa seemed to prevail, and he had noticed that the water at that time became slightly opalescent from minute suspended (*mica*) particles. He had never seen sprue attack Chinese in Hong Kong.

John Campbell Graham, M.D., Deli, Sumatra, stated that true sprue is not common in Deli, Sumatra. It was customary to call all cases of stomatitis sprue in Sumatra, and it was important to differentiate between these and true sprue, in which the characteristic intestinal manifestations were present.

Dr. Graham read an abstract from a paper on sprue by Dr. A. Van der Scheer, which he translated from the original Dutch text. Van der Scheer holds that there exists a casual relationship between marked or chronic appendicitis and sprue, and proposes to treat the disease by removal of the appendix.

A. J. Chalmers, M.D., Ceylon, considers that cases of sprue are rarer now in Ceylon than they used to be. He regards the liver as the organ essentially at fault. He had found good results from liver soup, a plan of treatment followed in Ceylon by the natives. Liver soup, with or without intestinal disinfectants, had given excellent results.

Major G. H. Fink, I.M.S., London, found in India that sterilised milk was eminently successful in the treatment of sprue. He was inclined to believe that the mica theory of the origin of sprue was the correct one, and was well aware of the difficulty in treating hill diarrhœa until the water was changed. He heartily subscribed to a remark made by Dr. Sambon that it would advance our therapeutic knowledge greatly were more attention given to native cures and to the drugs by which these cures were effected.

C. F. Harford, M.D., Livingstone College, London, said that tropical diarrhœa was the cause of a great amount of invaliding in warm countries. Some 500 missionaries, returning home after an absence of variable periods in the Tropics, all agreed that diarrhœa was the most frequent and the most serious cause of ill-health in the Tropics and sub-tropics. The pathology of intestinal tropical ailments was but ill understood and required to be scientifically dealt with in the immediate future if we hoped to reduce the enormous amount of invaliding which occurs amongst Europeans in warm climates.

JOHN HADDON, M.D., Berwick, advocated vegetarian diet in the treatment of intestinal ailments; he is of opinion that were a rigid vegetarian diet followed by Europeans in the Tropics intestinal ailments would be fewer.

J. H. EBELL, L.R.C.P., Colombo, Ceylon, said he was well acquainted with the treatment of sprue by liver soup in Ceylon and could testify to its efficacy. An old native treatment followed in Ceylon also was the administration of "toddy," made from the fermented juice of the cocoa-nut palm.

W. L. STRAIN, M.B., San Paulo, Brazil, stated that during twenty years' residence in Brazil he had no recollection of diagnosing a case of sprue. Diarrhœa is very prevalent amongst new-comers. Although San Paulo is inland and 2,700 feet above sea-level, he had never attributed the diarrhœa to elevation *per se*. Dr. Strain had found ox-bile efficacious in the treatment of diarrhœa in Brazil, and it was customary amongst residents in San Paulo to take ox-bile pills obtained from Erba in Milan.

Lieut.-Col. ANDREW DUNCAN said that he had found milk beneficial in sprue, but he found the meat-treatment efficacious in cases which milk did not cure.

JOHN HUTSON, M.B., Barbadoes, finds that in Barbadoes the disease termed locally thrush is really sprue. Curiously enough, pellagra complicated the disease in the West Indies. In many tropical regions fresh meat was difficult to get, and it was usually of very inferior quality. He had successfully treated sprue on a pure banana diet for three or four weeks with marked benefit. Corrosive sublimate in minute doses was frequently efficacious.

ON THE PRESENT THEORIES OF THE CAUSE OF BERI-BERI.

By J. TERTIUS CLARKE, L.R.C.P.

Perak, Malay Peninsula.

Dr. Clarke arranged the theories recently advanced as causes of beri-beri under four headings:—

(1) The arsenical theory of Ross has in support of its claims to consideration the similarity of the symptoms in beri-beri and chronic arsenical poison, and the fact that in some cases of beri-beri arsenic was found in the hair and under the toe-nails. In addition to several points of differentiation, the neuritis of beri-beri is chiefly parenchymatous, whilst that due to arsenic is mainly interstitial.

(2) The rice theory has its main support in the fact that Tamils are almost completely immune from the disease in a country where beri-beri is rife. The Tamils subject their rice before husking to a preliminary boiling, while the other races husk their rice raw, and so it may become contaminated by the poison which lies in the husk. Moreover, the Tamils take spices, curries, and essential oils with their food, which may serve as prophylactics against possibly infected rice.

(3) The place theory supposes that the virus exists in certain houses, ships, barracks, or amongst certain gangs of coolies.

(4) The theory of Hamilton Wright is that beri-beri is an acute infectious disease, having a definite primary lesion in the stomach and small intestine, and that the causal organism may be ingested in any food or drink accidentally contaminated, and may multiply and produce a toxin both in the contents and walls of the affected stomach and small intestine. Dr. Clarke instanced two institutions some 300 yards apart, one a hospital, the other an occasional vagrant ward. They were supplied with food from the same kitchen and by the same carriers. Beri-beri cases were admitted into both institutions, but in the hospital, although the more sanitary building, beri-beri spread to other inmates, and the majority died; yet in the vagrant ward the disease did not spread, and few died. The disease would seem capable of infecting a 'place,' may disappear from that place, and disinfection may apparently prevent further cases arising. Ward attendants rarely develop the disease, but Dr. Clarke mentions the case of a man who acted as ward attendant on beri-beri patients for nine years in a hospital, yet never contracted the disease until he went to work in the mines. Dr. Clarke surmised that the bed-bug might be the carrier of the disease, and experimented on monkeys, allowing bed-bugs from beri-beri patients' beds to bite the monkeys, but the result proved negative, as also did the experiment of crushing up some twenty bugs in water and injecting the preparation under the monkeys' skin. Dr. Clarke also injected 4 or 5 drachms of cerebro-spinal fluid taken from beri-beri patients into monkeys, but observed only slight paralytic effects in one monkey.

HAMILTON WRIGHT, M.D., late Federated Malay States, said: "In previous papers on the subject of beri-beri I endeavoured to show that the incubation period of the disease is short—from seven to fourteen days; that it is an acute or subacute infectious disease, due to a specific organism not yet certainly determined; that the organism is not one whose special *habitat* is any food such as fish or rice, but one that may nevertheless be ingested in any food and drink accidentally contaminated; that, after gaining an entrance to the alimentary canal, the organism multiplies in the contents of the stomach and small gut, but chiefly in the contents of the duodenum; that it there elaborates a toxin which, being absorbed, poisons certain afferent and efferent neurones to different extents and in different degrees, and thus gives rise to a group of symptoms which can be classified as acute pernicious, acute and subacute beri-beri. I pointed out that the probable duration of the active stage of the organism was from two to six weeks, and that after its active stage had ceased and its virus had been eliminated, the paresis or paralysis it had engendered persisted. For this persistent paralysis I proposed the term *beri-beric residual paralysis*. I maintained that the great mass of our knowledge of beri-beri was founded on the study and statistics of the residual effect of a disease—beri-beric residual paralysis—and not truly upon the disease itself, acute pernicious, acute and subacute beri-beri. It then seemed evident to me that we should be just as clear in our conceptions of diphtheria if we had based our calculations of it on post diphtheritic paralysis, as we are in our notions of beri-beri through basing our theories and hypotheses of it on its residual paralysis.

"In those previous papers I not only outlined my

clinical and *post-mortem* observations on man; but gave a fuller description of the disease as seen in monkeys which had contracted the disease after a short stay in an environment in which many adult male Chinese and other Orientals had succumbed.

"In my writings I have endeavoured to make it clear that there is not only clinical evidence, but also indisputable *post-mortem* evidence, that beri-beri must be regarded as an acute infectious disease, having a definite primary lesion. I have not by any means exhausted the subject either from a clinical or pathological point of view. It is not yet time for a finished monograph of the disease. Our present conception of beri-beri is more or less disordered."

David J. Galloway, M.D., Singapore, said that although most writers on beri-beri differed in their ideas as to the causation of the disease, they all seemed to gravitate to the question of alimentation. Attempts to explain the incidence of beri-beri by the diet seems futile. Dr. Galloway had observed that an early symptom of beri-beri was epigastric pain, anorexia, diarrhœa, dulness and rigidity over the epigastrium, pain over the duodenum, and a peculiar condition of the mouth. These signs and symptoms preceded localised œdema or neuritis by some ten or fifteen days. The habits of expectoration amongst the Chinese may be a factor in the spread of infection of beri-beri, and the house-fly may serve as a carrier.

W. L. Strain, M.B., San Paulo, Brazil, stated that he had seen three sporadic cases of beri-beri occurring in women after childbirth in Brazil. Although sporadic cases of the disease were not rare in Brazil, he had only seen one small epidemic in a goal. The native surgeon treated the cases with large draughts of cow's urine, which he regarded as a potent diuretic.

Malarial Fever in British Central Africa.

By H. Hearsey, M.D.

Principal Medical Officer, British Central Africa.

Two forms of malarial infection are met with in British Central Africa, the tertian and the æstivo-autumnal. Tertian fever is by far the more common, and it frequently takes the type of a double infection. Multiple infection by tertian parasites is met with, causing the so-called irregular fever, and is the only variety of the fever, which is generally resistant to quinine. Dr. Hearsey is inclined to regard hæmoglobinuric fever as a "pernicious" form of the æstivo-autumnal, the absence of the parasites in the peripheral circulation being probably due to their having left the peripheral circulation for the spleen and bone-marrow.

In regard to treatment, Dr. Hearsey says experience has taught him that patients with hæmoglobinuric fever do better without quinine. He has used instead, with beneficial results, a mixture of 10 grains of bicarbonate of soda and 30 minims of the solution of perchloride of mercury, given every two hours during the first day, and every three hours during succeeding days until the urine clears. An injection of ½ grain morphia controls vomiting; brandy is indicated, acid drinks are prohibited; barley water, Benger's food, chicken soup, Valentine's meat juice, and Brand's essences should be the diet.

Note on the Method of Taking Quinine in the Prophylaxis of Malaria.

By St. George Gray, M.B., B.Ch.

West African Medical Staff, Sierra Leone.

Few European residents in West Africa agree as to the method of taking quinine as a prophylactic in malaria. A man who takes 5 grains of quinine daily is pretty sure to escape malarial fever. This is, however, a large dose, and more than most men can stand. Three grains daily is often too much to be taken with impunity; yet it does not always prevent malaria. A man who takes 10 grains once a week is more likely to escape fever than he who takes 5 grains every other day. Dr. Gray bases his recommendations as to the taking of quinine on the fact that the life-cycle of the parasite is nearly always forty-eight hours, and that some eight or ten days must elapse after infection before the parasites become sufficiently numerous in the blood to cause an attack of fever. If, then, a 10 or 15-grain dose of quinine is taken on two successive days, with an interval of eight or nine days before the next two doses are taken, the parasites will always be destroyed before they can cause fever. It is advisable to explain to patients the reasons for the quinine being given at the time it is.

The Mosquito Malarial Theory and Malarial Prophylaxis from the Latent Phase.

By Major G. H. Fink, I.M.S. (retired).

Major Fink drew attention to the *constant* source of malarial fever in tropical regions as opposed to the *accidental*, as he terms it, through the bites of a particular species of mosquito called the Anopheles. Major Ronald Ross, in dealing with the subject, states that the bite transmits the infection through letting loose or injecting the malarial parasite through the proboscis of the insect into the blood of man. Major Fink does not consider that the constant source of malarial fever lies in the bite of the mosquito, while, even as an accidental cause, it occurs in perhaps 5 to 10 per cent. cases by the mere bite and nothing else. Major Fink maintains that there is a constant source of malarial fever, apart from the bites of mosquitoes, and in the accidental infection there is not so much danger from the mere bite of mosquitoes as the destruction or killing of the mosquito over the spot it has bitten man, through which the malarial blood obtained from a malarial patient previously is smeared over the bite, and this infects man by the same process as vaccination by scarification and rubbing in of vaccine lymph. The most constant source of malarial fever is through the phase known as the latent phase, which by all authorities is acknowledged to be present, but not yet demonstrated.

Malaria, in uninhabited or supposed uninhabited malarial regions, waits in its latent phase until man's presence and the introduction of the parasite in his blood occurs, which is the favourable opportunity. Even if a region be said to be *free* from malaria, because of the *absence* of the Anopheles mosquito at the time, the forces of Nature bear the parasite through water and wind to any direction, when storms and inundations occur. Supposed uninhabited regions in the Tropics are found to have been inhabited in bygone years. "I am in a position to prove my point

from archæological remains discovered in what we considered virgin forests, which clearly show a high degree of civilisation in those forests at one time, and the story of malaria is therefore an old story, though not explained by those who have hitherto investigated it; hence we can realise now that the turning up of fresh jungle land and the construction of railways by new cuttings in the Tropics is sufficiently and scientifically explained by me in the life-history of the sporozoa in its hosts (man and mosquitoes), as well as in the latent phase in the dust and water, which phase reaches man's body, through worms and their ova in the dust which bears the parasite in its 'free parasitic stage,' which is almost indefinitely maintained. We cannot believe that the more *constant source* of malaria is any other than what I have here stated in connection with the latent phase from what most observers in the Tropics have noted for years in malarial attacks, whereas the bites of the mosquito produce the accidental or chance infection. By drinking water and the dust which gets into the water in the Tropics we have a far greater chance of taking in the malarial parasite than through the bites of the mosquito merely as described by Ross and others. But wherever malarial fever prevails largely, there entozoa and skin diseases are prevalent in undue proportion as compared with other diseases, so that ectozoa and entozoa, but chiefly the latter, convey the malarial parasite for the process by schizogony into man's blood, and before that process can be fully carried out and maintained for an attack of malarial fever, there must be anæmia and hydræmia, which are conditions necessary for further attacks of the parasite on the red blood corpuscles, and which occur at the time the 'primitive bodies' are introduced. The intermittent, remittent, and cachexial forms of malaria depend upon the species of mosquito or sandfly. In moist, clayey soils, where rice-fields and swamps abound, it is the Anopheles; but in dry, sandy soil, with very little swamp, where wheat-fields occur, it is the sandfly. In Bengal and the junction of Bengal with the North-West Provinces of Oudh, the former conditions exist, and the intermittent forms of malarial fever prevail; but in the North-West Provinces in Oudh itself, and its junction with the Punjab in Sinjh, the latter, with remittent forms, exist."

Note on Two Cases of Beri-beri Treated with Strychnine Injections.

By R. Tanner Hewlett, M.D., M.R.C.P.
Lecturer on Bacteriology, London School of Tropical Medicine; Professor of General Pathology and Bacteriology, King's College, London.

A Norwegian seaman contracted beri-beri whilst on a voyage from the West Indies to London. The acute symptoms subsided, but he was left with considerable difficulty in walking. Strychnine, arsenic, and iron were given, and galvanism applied to the leg for some three weeks without marked improvement. When, however, $\frac{1}{50}$ grain of strychnine was injected twice daily alternately into each thigh—*i.e.*, each thigh received one injection daily—in a week's time the patient could walk fairly well, and in two weeks' time completely recovered. Dr. Hewlett reported similar treatment in the case of a German sailor who had beri-beri paresis for some nine months. Injections of $\frac{1}{80}$ grain of strychnine enabled the patient, who was bed-ridden, to walk with a stick in six weeks' time.

Blood Counts in Acute Hepatitis and Amœbic Abscess of the Liver, with Further Experience of the Relationship of the Amœba Dysenterica to Tropical Liver Abscess.

By Leonard Rogers, Captain, I.M.S.

Rogers has found blood counts, especially with regard to the presence or absence of leucocytosis, of great diagnostic value. There is a striking difference between cases of hepatitis ending in resolution and cases of hepatitis ending in suppuration. In the former, leucocytosis is either absent or limited to a very slight degree; in the latter, even when the signs and symptoms of abscess were quite indefinite, a greater or less degree of leucocytosis was almost uniformly present. In cases in which abscess was evidently present, leucocytosis was also, as a rule, present.

In acute hepatitis with suppuration, Case 1 gave the following counts: Red corpuscles, 5,390,000; white corpuscles, 11,500—that is, of white to red, 1 to 468; polynuclears, 73; lymphocytes, 23; large mononuclears, 4. In cases of liver abscess the count (Case 6) showed: Red corpuscles, 2,670,000; white corpuscles, 13,250—ratio of white to red, 1 to 201; polynuclears, 68; lymphocytes, 20; large mononuclears, 12.

There is great variability in the degree of leucocytosis present, but in all cases of hepatitis leucocytosis should be carefully watched for, and the proportion of white to red corpuscles, rather than the actual number of either, taken as the crucial test. In the cases related Rogers instanced one in which leucocytosis was marked, but the fall of the temperature to normal seemed to indicate the absence of pus, but a relapse occurred, and a large abscess was opened. Another case, a patient with fever and a blood count which indicated pus, was treated for malaria and sent on a sea voyage; the leucocytosis in this case also proved to be diagnostic, as the patient developed a liver abscess on the sea voyage.

From a clinical point of view, a case recorded by Rogers is very interesting; it is that of a patient with cœliac aneurysm with leucocytosis which simulated liver abscess. The lesson to be learned therefrom is that even with local signs of hepatic trouble other causes of leucocytosis ought to be excluded before concluding that the hepatic lesion is the cause of the leucocytosis.

Rogers' conclusions are: (1) Absolute leucocytosis is nearly always found in amœbic abscess of the liver, but rarely in chronic cases with marked anæmia when only a relative leucocytosis may exist; (2) the degree of leucocytosis is very variable, being highest in the most acute cases, while a low degree is commonly met with in cases with an insidious onset, in which repeated examinations may be necessary; (3) in acute hepatitis without suppuration, leucocytosis, both absolute and relative, is nearly always absent; a slight degree may sometimes be met with in the more acute cases, but the symptoms usually yield rapidly to large doses of ipecacuanha if no suppuration is present.

Further Experience on the Relationship of the Amœba Dysenterica to Tropical Abscess of the Liver.

By Leonard Rogers, Captain, I.M.S.

In a series of thirty-five consecutive cases of liver abscess, reported at the Section of Tropical Diseases at the British Medical Association three years ago, Capt. Rogers stated that he had been able to find living amœbæ either during life or *post mortem*, two-thirds of which were otherwise sterile. He has continued his investigations in this direction, and his subsequent observations tend to confirm the constant presence of amœbæ in liver abscess associated with amœbic dysentery. He gives details of a case in which no amœbæ were found, but he believes the age of the abscess and its thick fibrous wall serve to explain their absence. Rogers also mentions a case of triple tropical abscess of the liver with amœbæ in only two of them in a patient who had suffered from chronic amœbic dysentery.

Cases of Liver Abscess, July, 1904, to July, 1905.

By James Cantlie, F.R.C.S.

Seven Cases of Hepatic Abscess, July, 1904-1905.

Mr. Cantlie reported three cases of liver abscess which he had operated upon successfully by the trocar and cannula and syphon drainage. One patient came from Brazil, another from India, and another from Mexico. Two of the patients developed the abscess whilst in England, the third on the way home from India. In one the abscess was deep-seated and suprahepatic, the needle reaching pus at a depth of 4 inches from the surface on the dome of the liver; in another the abscess was close below the surface (intrahepatic) of the chest wall, and contained some 3½ pints of pus; in the third case the pus (intrahepatic) had opened into a bronchus, and was being coughed up; the tract was reached 6 inches from the surface along the side of the pericardium. A fatal case of abscess of the liver was described by Mr. Cantlie in a man from India who had been invalided home on account of hepatitis, but who did not show signs of abscess until he had resided in England some weeks. The pus (a small quantity) was found 4 inches from the surface, only a few days after the abscess had been diagnosed by Mr. George Morgan, F.R.C.S., of Brighton. Satisfactorily drainage was re-established, but the patient died suddenly on the sixth day after operation, when the right side of the liver was found to be gangrenous. The drainage tube was found to be in the abscess cavity in the upper part of the liver; but there were two or more other foci of pus on the right side of the liver. Mr. Cantlie stated that gangrene of one half of the liver was a unique condition in his experience.

Mr. Cantlie had also operated upon two cases of hepatic abscess at a period when the pus had invaded the lower lobe of the right lung and destroyed it. Both cases died, although the cavity in the base of the right thorax had been freely opened and the abscess cavity packed. A case of abscess of the liver in a man who had never been out of England was related by Mr. Cantlie. In this case alone were other organisms than amœbæ found. Streptococci were present in abundance, and the whole history of the case seems to indicate pyæmia as the cause of the abscess. At the moment of writing the patient was doing well.

Note on a Peculiar Schistosomum Egg.

By S. R. Christophers, M.B., I.M.S., and J. W. W. Stephens, M.D., Lecturer, Liverpool School of Tropical Medicine.

The eggs were met with in the urine of a native of Madras suffering from hæmaturia. The egg differed from that of the *Schistosomum hæmatobium*, inasmuch as it was of a long spindle shape, and from the thick end of the egg a long, snout-like process projected. The egg measured 205·2 μ by 53·2 μ, being therefore longer than other schistosoma eggs. In the urine there occurred also eggs indistinguishable from that of *S. hæmatabium*, so that the significance of the spindle-shaped variety is uncertain.

Two Further Cases of Snake-bite Successfully Treated by Local Applications of Permanganate of Potassium, with Suggestions for Extension of its Use.

By Leonard Rogers, Captain, I.M.S.

In February, 1905, in the *Indian Medical Gazette*, Rogers placed on record five recoveries from snake-bites from treatment by permanganate of potassium applied locally, after incisions through the fang marks had been made. He now adds several cases successfully treated by patients' relatives; one was that of a bite of a Russell's viper, a ligature was applied on the proximal side of the bite, the wound was sucked, then lanced freely, and the part (the arm) soaked in a strong solution of permanganate of potassium for half an hour. Another case, bite from a cobra, was successfully treated with the snake lancet after half an hour had elapsed. Capt. Rogers suggests that scorpion-stings, wounds inflicted by wild animals, by rabid or supposed rabid animals and even in the prevention of infection of dust-laden wounds by tetanus, permanganate of potassium in crystals, in strong solution or hypodermically, should be tried as a routine method of treatment.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the Journal of Tropical Medicine *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Therapeutic Gazette," April 13, 1905.

Yellow Fever. Fernandez de Ybarra.

The best way to manage a case is simply by careful nursing and strict attention to the individual symptoms present. As this justly dreaded malady is self-limited, its course cannot be arrested by any drug or combination of drugs whatever. No "heroic" or even too active medication, therefore, should be employed. Every case ought to be regarded as serious, no matter how slight the symptoms may appear, and on account of the great structural alterations which are going on in the blood and visceral organs the closest medical attention and the most judicious nursing are required.

In those parts of the Western Hemisphere where yellow fever is known as a common disease owing to its constant appearance for a great number of years, the standard initiatory treatment is always a cathartic of some kind. The majority of the older practitioners in those localities give a full dose of oleum ricini: some add the juice of a ripe lemon mixed up with the oil, or give 30 grammes of sulphate of sodium (one ounce).

The recognition of this disease, speaking in general terms, is easy. Whenever, during summer weather, we are called to see a patient suddenly taken sick with one paroxysm of cold or chilliness (which occurs eight times out of ten when the sun has disappeared from the horizon), followed by a rapidly rising fever (102°, 103°, 104° F.), and accompanied by headache, pain in the back and lower limbs; the face flushed with an anxious expression, and the eyes injected and watery; hurried breathing; the stomach very irritable, with great epigastric discomfort and tenderness on pressure, nausea, and anorexia; the tongue moist, slightly coated, sometimes red at the tip and edges, yet otherwise natural; bowels constipated, and in some cases gurgling in the right iliac fossa; lessened quantity of urine, darker than naturally in colour, and albuminous; general muscular debility; pulse rapid, strong, tense, sometimes dicrotic, with from 90 to 120 pulsations to the minute; skin hot, dry and harsh, and if not all these characteristic symptoms, at least the great majority of them, without a previous history of yellow fever, then we may unhesitatingly pronounce the disease yellow fever in its incipiency.

In a case calling for the prompt abatement of the temperature and for a nervous sedative, in the new antipyretics we have nowadays at our command several remedial agents, almost any one of which is far better for that purpose than quinine. Aconite, digitalis, and veratrine, in small doses, are also superior to quinine for the same object.

Jaborandi acts in a doubly beneficial way, for it not only promotes perspiration, and thereby elimination of the yellow fever poison through the skin, but also relieves the congestion of the kidneys. I prefer to use the infusion of the leaves, administered hot, to the hypodermic injection of pilocarpine, though when the leaves obtainable are too old I also make use of the alkaloid subcutaneously.

The great desideratum in the treatment of yellow fever is not to disturb the stomach, and to relieve the congestion of the kidneys.

Of baths of all kinds, the only appropriate one is the hot mustard foot-bath at the beginning of the attack. It relieves the cerebral congestion and headache then existing, and often induces free perspiration, followed by sleep. Mustard plasters over the epigastrium ease the distress, and sense of weight or pain in the stomach.

Diaphoresis and diuresis may be promoted also by large draughts of lemonade made with seltzer water, hot decoction of orange leaves sweetened to taste, or by simple Vichy or soda water. Another means of at once relieving the renal congestion is by a rectal injection of fresh water; the kidneys are thus refreshed and their congestion immediately improved.

Stimulants should not be given at all, with the only exception, perhaps, in some cases in which the patient has been in the habit of using them, of iced champagne.

When the pulsations of the heart have fallen to 50 to 60 per minute, there are several cardiac stimulants at our disposal far superior to alcohol in these cases. A favourite one for this purpose is digitalis.

T. P. B.

"Interstate Medical Journal," July, 1905.

Proper Diet in the Tropics.

Wiley, H. H., states that any large excess of protein in a tropical diet is contraindicated; hence fruits which are deficient in proteid substances are chosen by natives of tropical countries. Starch and sugar furnish the heat and energy of tropical diet which should contain less caloric than a diet in the temperate regions and decidedly less protein.

EXCHANGES.

Annali di Medicina Navale. Annali d' Igiene Sperimentale Archiv für Schiffs u. Tropen Hygiene. Archives de Medicine Navale. Archives Russes de Pathologie, de Médec. Clinique et de Bacteriologie. Australasian Medical Gazette. Boletin de Medicina Naval. Boston Medical and Surgical Journal. Bristol Medico-Chirurgical Journal. British and Colonial Druggist. British Journal of Dermatology. British Medical Journal. Brooklyn Medical Journal. Caducée. Climate, Clinical Journal. Clinical Review. Giornale Medico del R. Esercito. Hong Kong Telegraph. Il Policlinico. Indian Medical Gazette. Indian Medical Record. Indian Public Health. Interstate Medical Journal. Jahresbericht. Janus. Journal of the Royal Army Medical Corps. Journal of Balneology and Climatology. Journal of Laryngology and Otology. Journal of the American Medical Association. La Grèce Médicale. Lancet. Liverpool Medico-Chirurgical Journal. Medical Brief. Medical Missionary Journal. Medical Record. Medical Review. Merck's Archives. New York Medical Journal. New York Post-Graduate. Pacific Medical Journal. Polyclinic. Public Health. Revista de Medicina Tropical. Revista Medica de S. Paulo. Sei-i-Kwai Medical Journal. The Hospital. The Northumberland and Durham Medical Journal. Transactions of the American Microscopical Society. Treatment. West India Committee Circular. West Africa.

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Original Communications.

NOTES ON UNCINARIA AND OTHER INTESTINAL PARASITES IN THE WEST INDIES.

By C. W. Branch M.B., C.M.(Edin.).
St. Vincent, W.I.

From an old book, "On the Management of Negro Slaves," by an anonymous writer who was apparently a doctor and planter, I extracted the following:—

"The Mal d'estomach, or Dirt-eating.

"When a negro is languid and listless, and so much indisposed to motion as to require to be impelled to it by threats, when he is short-breathed and unable to ascend a hill without stopping, his efforts for that purpose being accompanied with a throbbing of the temples and a violent palpitation of the heart; when he complains of giddiness, his lips being pale, and his tongue white, you may know him to labour under that disorder which the French call the *mal d'estomach*, and the English after them by the same name, or 'dirt-eating,' from the propensity which there is in that case to eat chalk, or clay, or some other kind of dirty substance. . . . . "

"This disorder, which, as I before observed, is very common on the West India estates, is also one of the most obstinate and troublesome that negroes are afflicted with. It disables them from effective labour for a considerable time, sometimes for years, and often terminates in dropsy."

Here we have, perhaps, the earliest description of Uncinariasis, and no better picture has been drawn by later writers.

The author's treatment was 30 grs. of powdered ipecac. at night, followed next morning by a dose of castor oil. No doubt he must have secured the expulsion of some of the worms by the emetic. He then gave an electuary of iron filings washed down by a "bitter infusion" twice a day. The latter consisted of aloes and bitter-ash (simaruba) in rum and water. A generous diet and graduated exercise assisted in the recovery.

The treatment was sound and practical, though the drugs were crude and he had no knowledge of the causation of the disease.

The pathology he describes as a condition of "relaxation and its natural concomitant, an impoverished state of the blood."

The cause he ascribed to poor feeding and mental depression.

About 1892 (I speak from memory) Dr. J. Conyers, of British Guiana, contributed an important paper on "Anchylostomiasis" to the *British Guiana Medical Journal*. Soon after this Dr. Galgey reported the prevalence of this disease among coolies in St. Lucia. In 1894 the writer found the worm in St. Kitts, where the disease had long been distinguished as a pathological entity of unknown cause, under the name of "Portuguese white liver." It was considered an incurable anæmia producing fatty degeneration of the liver.

Uncinariasis has for some years been well known as such in Barbados, though from my observations there it does not receive the systematic recognition that it deserves.

In 1899 Dr. MacDonald discovered the worm in Antigua, and I then drew his attention to the pigmentation of the tongue, a feature pointed out to me in St. Lucia by Galgey, and since discussed by Leonard.

In 1900 I treated a case of uncinariasis in Inagua, Bahamas, which had been infected at Bluefields, Nicaragua.

On my arrival in St. Vincent in 1902, I found such a prevalence of uncinaria as I had never seen or heard of elsewhere. I reported this condition in the hospital report for that year published in "Colonial Reprints," but have since tried to ascertain more exactly the degree of infection of the population.

In 1904, Dr. Leonard, who had made himself familiar with uncinaria in St. Vincent, went to Grenada and proved its remarkable prevalence there also. The disease had been previously recognised and a few cases treated, but Leonard drew attention to its real importance in Grenada.

In 1905, while on a visit to St. Croix, I satisfied myself of the occurrence of uncinaria there also, though no opportunity of microscopic search was available. There were, I was given to understand, no microscopes at the hospitals, but no doubt the Danish medical men, who were very interested in the subject, have by this confirmed my opinion.

The results of the Porto Rico Commission will be historic.

Even from these few records which have come within the writer's knowledge, it is certain that uncinaria has long existed, and must now be exceedingly prevalent throughout the West Indies. In some places it is still apparently overlooked, and in others its prevalence and importance is not fully appreciated.

Other Intestinal Parasites.

In the course of examinations of fæces in St. Vincent other intestinal parasites have been observed whose occurrence is worth recording. Several times as many as five parasites were found in the same individual.

Notes were kept of 414 cases; of these 298 were examined especially for uncinaria, and this series will not give a fair ratio for this worm, though it will indicate the incidence of the other parasites; 116 hospital and dispensary patients of the labouring class, taken at random, were examined in order to determine the percentage of uncinarial infection.

In 116 cases:—

Uncinaria ...	77	equal to 66 per cent.
Ascaris	71	
Trichocephalus ...	45	
Rhabdonema ...	11	
Oxyuris	4	
Nil	7	equal to 6 per cent.

Two-thirds of the labouring class of the island are therefore infected more or less with uncinaria. Only 6 per cent. harbour no worms.

In 414 cases:—

Uncinaria ...	340	
Ascaris	232	equal to 56 per cent.
Trichocephalus	220	,, 53 ,,
Rhabdonema ...	47	,, 11 ,,
Oxyuris ...	6	
Cercomonas ...	2	
Amœba ...	2	
Balantidium ...	2	
Nil	14	

Besides these have been seen *Tænia solium*, *Bothriocephalus latus*, and *Myiasis* of the rectum.

One remarkable case, a child brought into hospital almost moribund with dropsy and anæmia, was successfully treated, though stocked with tænia, uncinaria, ascaris, and rhabdonema.

Rhabdonema received but scant attention from some authors on tropical medicine, though Sonsino, in Davidson's "Diseases of Warm Climates," attributes to its presence a chronic diarrhœa.

From one's own experience, the writer is convinced of the soundness of this view. A mild infection is comparatively common without symptoms, but every case with numerous embryos in the fæces is very ill. I have seen some cases of pure rhabdonema infection not complicated with uncinaria, and I have seen three cases die of rhabdonemiasis, one some little while after he had been cleansed of uncinaria for the second time.

In rhabdonemiasis there is a light brown fluid stool of very offensive smell. The diarrhœa is worse at night; it recurs frequently during, it may be, several years. At length, when the cases are bad, they have anasarca of the legs and scrotum, and perhaps also of the lower part of the abdomen and buttocks. There is not the tendency to general dropsy seen in advanced cases of uncinaria.

Unfortunately we have no means of expelling this worm. In my experience it survives attacks with thymol, turpentine, male-fern, and santonin. Dried papaw seed up to 40 grs. three times a day has been tried, and cow-itch (*Mucuna pruriens*) in molasses in large doses (2 oz. of the syrup daily for a child), without avail.

In cases of mild infection the embryos are not found every day, and this must be borne in mind.

I found rhabdonema in St. Kitts also this year.

Balantidium has lately been brought to notice in the United States. It undoubtedly produces a persisting diarrhœa.

I examined lately, with Dr. E. Branch at the St. Kitts Hospital, a case just admitted with chronic diarrhœa. We found balantidium only. Thymol 120 grs. given one day secured the absence of the parasites and the rapid recovery of the patient.

Two cases of my own in St. Vincent had uncinaria also.

In a third, balantidium was still present along with rhabdonema, after the administration of thymol for uncinaria.

Uncinaria and Thymol.—My own routine, following Sonsino, is to give 2·0 gme. at 4, 6, 8, and 10 a.m. on an empty stomach; breakfast of milk or pap at 12, and a dose of mag. sulph. earlier or later in the afternoon, according to the state of the patient and the action of the bowels. Some bear this without discomfort, and others suffer from giddiness, drowsiness, or vomiting. In old, feeble persons coma and death within forty-eight hours has resulted when the bowels remained obstinately constipated. The same dose has been given to children of tender years, but as they usually vomit some of the drug, one gives 90 grs. for economy.

The patient is usually sent home next day, unless he be dropsical or very anæmic and feeble. Many are not seen again, and it is inferred that these have been relieved. But among those who have furnished specimens for re-examination I have notes of the following cases:—

1	after	6·0	gme.	thymol	...	Uncin.	1	...	None 0
121	,,	8·0	,,	,,	...	,,	41	...	,, 80
16	,,	10·0	,,	,,	...	,,	2	...	,, 14
1	,,	13·0	,,	,,	...	,,	0	...	,, 1

It is evident from these figures that the single administration of thymol in the usual dose of 8·0 gme. in a large number of cases does not complete the expulsion of uncinaria.

Cases that had been completely rid of parasites in 1902, and become red and robust, have returned in 1904 with dermatitis and commencing symptoms of anæmia again. The dermatitis, "ground itch" it is called in St. Vincent, is very common in children, especially such as play on the bay in Kingston, where the sand is polluted with night soil.

Ascaris.—The experiences of a West Indian practitioner with the common round worm may not be uninteresting to our brethren in Europe. I have known over 100 worms passed in twenty-four hours from a child less than two years old. In the West Indies worms very commonly pass by nose and mouth; one has pulled them out on making a rectal examination, or felt them in the gut during a hernia operation. One child was said to have passed two large worms through the navel, and after admission to hospital another worm 8 inches long appeared under the dressing. No fæces came by the fistula, but pus.

Another child of eight months passed a worm through the top of a raw red swelling of the umbilicus which had been present since birth. This proved to be a prolapsed intestinal fistula, and was operated on and closed.

Worms may conveniently be felt for through the "bung-navel" which nearly all negro children have. Sometimes one can explore the abdominal cavity very satisfactorily in this way.

THE PATHOLOGY OF THE YAWS NODULE.

By J. Numa Rat, M.R.C.S., L.R.C.P.
Leeward Islands, W.I.

It is satisfactory to find, from his recent contribution on the above subject to the Journal of Tropical Medicine, that Dr. George Pernet's researches support the theory that the typical encysted excrescence which characterises yaws is due to a microbial invasion of the skin from without.

I drew attention to the probability of such an origin of the yaws nodule in a paper of mine published some

time ago in the above Journal, and pointed out the advisability of thorough disinfection of the skin in all cases of the disease and of the removal of the patient from all sources of such local contagion.

Many years ago I was led to believe that the granulomata of yaws were like what is known as "proud flesh," the result of an effort to expel some foreign object, which in the case of this disease was the germ thereof. It seemed to me at the same time that this process of expulsion was from within outwards, the offending microbe having already entered the cutaneous tissues, probably through the lymphatic system. Further consideration of the subject led me to the conclusion which I expressed in my paper, to which I have above referred, that while its papules and squamæ were possibly the only cutaneous manifestations of the affection in its action on the system generally, the encrusted granulomata were produced by the external invasion of bacteria.

This question is one which is of much importance in reference to treatment. Such mode of production of the yaws granulomata would demand their early destruction by local applications, persistent disinfection of the skin over a considerable period, and the removal of the patient from the dwelling in which he contracted the disease to a non-infected one.

The careful and frequent disinfection of the skin of a yaws patient has not hitherto entered, as it should have done, into the therapeutics of this affection. The idea is unconsciously acted on by those who go down to the sea and scrub patients in its waters, and by those who cauterise the growths referred to, but the systematic and general disinfection of the whole integument for the purpose of destroying morbific germs is not part of the practice of even yaws hospitals, neither does the disinfection of the wards themselves enter into the method of dealing with the disease in such institutions.

It is evident that, assuming such an origin of the yaws nodule, regular and thorough disinfection of the skin and the transference of the patient to a non-infected place are the rational measures to be adopted in our treatment of it both for curative and prophylactic purposes.

SIMILARITY IN NATURE OF SOME OF THE MORPHOLOGICAL CHARACTERS AND HABITS OF INSECTS.

By Major G. H. Fink, I.M.S., M.R.C.S. (Eng.), L.S.A. (Lond.).

In India, and I have no doubt in the Tropics generally, we find certain morphological characters and habits running with striking similarity among insects. This is to be chiefly noticed between the various bees, hornets, wasps, and the dragon-flies to mosquitoes; and also of the Simulidia, or sand-flies, to the latter (mosquitoes).

The figures from 1 to 5 are given as examples from drawings I have made of mosquitoes in the Tropics, showing the size in Nature and an enlargement given to bring out the markings more clearly. They explain what I mean.

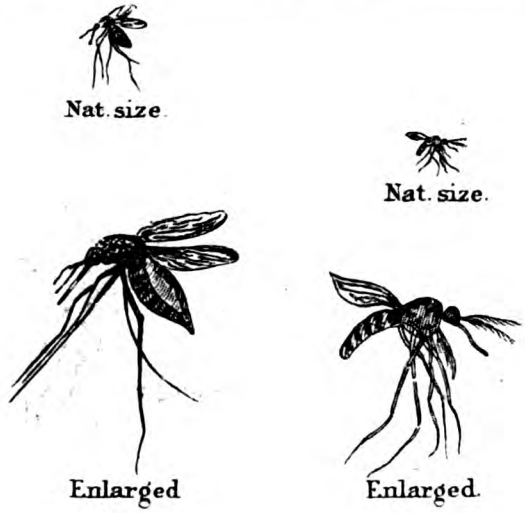

Fig. 1. Fig. 2.

Fig. 1.—The Bee Form of Mosquito.

Head: black, speckled behind.
Body: distinctly bee-shaped, dark brown, striped in darker bands on ventral aspect, with a fawn colour between the stripes. Dorsal aspect of body and legs speckled.
Proboscis: stout and thick.
Wings: marked as above.
Neck: set on body firmly with head protruding, of a cobra shape and powerfully built.
Buzzes loud, attacks in swarms like bees, and sticks tenaciously when it bites.
Called the bee form because of its bee-like characters and habits.

Fig. 2.—The Wasp Form of Mosquito.

Attacks like wasps in swarms, flies past and gives a bite. Most persistent in attacks if you enter into their neighbourhood in tropical countries.
Body: hornet or wasp-like, reddish yellow, rust-like, and sometimes a bright yellow, with dark bands across on dorsal aspect.
Head: set on a longish neck, while there is a distinct waist between thorax and abdomen. Most voracious in its habits.
Called wasp-like because of their resemblance to wasps in colouring and habits.

Fig. 3.—Snipe-like Type of Mosquito.

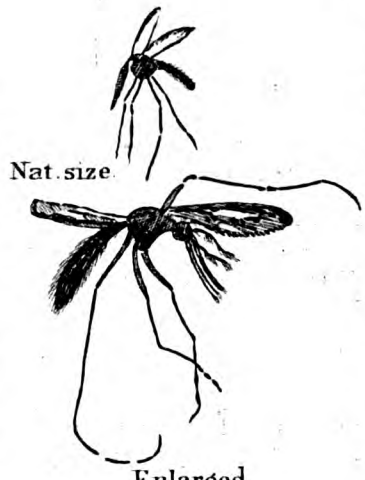

Fig. 3.

So called because of its length of proboscis, resembling the snipe's bill. It is coal-black in colour throughout, with a proboscis of very unusual length which looks more like a supernumerary leg when it attaches itself to a mosquito net or the white lime-washed walls in India.

The wings are feathery with striæ.

The tip of proboscis is tipped with a yellow colouration. Its bite is severe, and a very peculiar thing about it is that after its biting of a malarial person it passes two or three droplets of a sanguineous discharge *per anum* which turn yellowish, and last of all, like water.

FIG. 4.

FIG. 5.

FIG. 4.—THE SHEPHERD'S NEEDLE TYPE OF MOSQUITO.

So called because of its resemblance to an insect known as Shepherd's Needle in India, which hovers over tanks and water-courses, and is harmless in its bites.

Not of much consequence from the point of view of disease.

FIG. 5.—DRAGON-FLY TYPE OF MOSQUITO.

So called because of its resemblance to the dragon-fly. Is harmless and exceedingly weak.

Now with regard to sand-flies (*Simulidia*), they are found in sandy districts chiefly, but may also be seen in clayey districts at the foot of the lower ranges of hills in India where malaria abounds, and here they are almost worse than in sandy regions.[1] Fig. 6 gives the body, thorax, and part of the head of a female sand-fly.[1] Fig. 7 gives the body of another full of

FIG. 6.

Photomicrograph of SANDFLY *(Simulidium)*, showing the form of the body.

parasites of a *flagellated* character and resembling the *cercomonas*. Two are clearly seen where marked ←— in fig. 7. If you take a large group of sand-flies on a slide and examine them, you will find a variety of shapes and forms which resemble mosquitoes morphologically, and among a group of about 200 or more, perhaps only two or three will present the characteristics which are peculiar to figs. 1 and 2 among the mosquitoes, and have the parasites present as in fig. 7. My object in pointing this out is, that in certain regions in India these sand-flies inflict bites on parts of the body of human beings which are exposed when

FIG. 7.

Photomicrograph of SANDFLY *(Simulidium)* taken in London of specimens brought from India (Assam), showing the interior of body crowded with cercomonas in their parasitic form. Two are distinctly figured where the arrow ← points. I have seen tropical ulcers created by these insects.

wearing a pyjama suit, namely, face, ankles, wrists. The bites are very irritable, produce a papule, then a small vesicular head which, when rubbed off, shows an excoriated surface which increases day by day in circumference and depth, assuming at last the size of a 6d., 1s. or 2s.-piece at times; no discharge, except a very slight sanguineous one with a blush around it, which looks angry and red like a carbuncle at times. The novice is likely to mistake these ulcers which are tropical as *specific*, especially when they are single and not multiple. Moreover, they are copper colour on healing; but their locality, cause, and the fact that they do not present the thickening around the edges, as if a strip of parchment were let in to the edge, decides their character.

TREATMENT.

(1) *Preventive.*—Mosquito nets of the usual netting are absolutely useless to keep out sand-flies. You must have *mul-mul* nets, and if you wish for a comfortable rest at night, use a soap composed of castor oil, glycerine, peppermint oil, and liquor potassæ, and smear or lather it over exposed parts before sleeping.

(2) *Curative.*—If bitten, rub the tip of a Tænd-stikker match moistened with water over and around the part bitten, when all pains and irritation disappear and there is no ulcer. If an ulcer forms, equal parts of strong carbolic acid and camphor mixed and put over the ulcer daily with a camel-hair pencil will disperse the sore rapidly.

As general treatment, a tonic of quinine and iron in soluble form, three times a day after meals, in water or lime-juice.

Remarks.—These tropical ulcers are said to be protective against malarial attacks by some of the Baids and Hakims. They are most obstinate to treatment

[1] Figs. 6 and 7 were passed round at Leicester in the Tropical Section of Medicine, on July 27th, 1905.

by other means than those given above. Strong carbolic acid and camphor in equal parts mixed does not cause that burning which some might suppose would occur, and there is no need to fear it, especially if the surface of the ulcer be first gently wiped with absorbent antiseptic cotton-wool, and then painted with the mixture of these two drugs. I have treated horses with bursatee of the legs in the same way with success, and I would recommend its trial for rodent and other ulcers.

PRECAUTIONS AGAINST THE SPREAD OF PLAGUE IN CALCUTTA.

(1) Do not sleep on the bare ground at night, but on a charpoy, box, or shelf.

(2) Do not touch a dead rat with the hands, or eat grain in which dead rats have been found.

(3) Throw outside the dwelling all waste which rats will eat or upon which flies will settle.

(4) Avoid the breath and do not touch the face of a person dying or dead from plague.

(5) Clean away all discharges from the nose, throat, or bowels of a plague patient which soil his clothes or bedding, or those of other people.

(6) Do not shut up sleeping rooms at night, but allow plenty of fresh air to come in.

(7) Wash all clothings and dry them in the sun with beddings, &c., regularly.

(8) Flush all drains and privies at least twice daily.

FREDERICK PEARSE, M.D.,
Special Health Officer.

February 15th, 1905.

CAPTURE AND DESTRUCTION OF RATS IN CALCUTTA.

RATS being now recognised as the chief means by which plague is spread, the Chairman offers the following rewards and inducements to effect their destruction :—

For live rats—one anna.

For dead rats—one pice.

They may be brought to Municipal Office, Cornwallis Street; Incinerator Station, Moulali Durga, Entally; Municipal Office, Alipore, daily, Sundays excepted, from 8 a.m. until 5. p.m.

Occupiers of premises infested with rats may have them treated with rat-poison free of charge, on application to the undersigned.

FREDERICK PEARSE, M.D., D.P.H.,
Offg. Special Health Officer.

Central Municipal Office,
July 26th, 1905.

The notice here reproduced has been circulated extensively in Calcutta ever since the dates of their issue. Dr. Pearse, in a letter to the Editors, states that the rat is held in some sort of veneration in Calcutta, and that although thousands upon thousands of low class people in the city earn only about 8 rupees (10s. 8d.) per month, yet the number of rats brought into the stations has been very disappointing.

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THE

Journal of Tropical Medicine

SEPTEMBER 1, 1905.

ROST'S LEPROLIN.

IT would appear from the experiments carried out by Lieutenant-Colonel Semple, Director of the Pasteur Institute, Kasauli, India, in order to test Captain Rost's claim to have succeeded in cultivating the leprosy bacillus, and to have prepared a curative agency—Leprolin—have ended in proving a negative. The cultivation of the bacillus of leprosy having failed, there could, of course, be no preparation of Leprolin from such cultivation. The experiments were conducted by Colonel Semple with every possible precaution, and in a manner which leaves no doubt as to the accuracy of his conclusions.

Captain Rost co-operated in the experiments, and approved of the manner and methods of the tests applied. He selected the leprosy cases from which the cultivations were made, and everything he wished done during the enquiry

was carried out, even to the producing an atmosphere as similar as possible to that of Rangoon, where he had worked at leprosy. Colonel Semple concludes that defective technique in the preparation of the media, and the non-prevention of contamination of the cultivation, have been the cause of Rost's mistakes. When a sterile medium was used and subsequent contaminations avoided the results were negative. The good results obtained by the injection of Leprolin, as witnessed by Rost and others in Rangoon when injected into lepers, is ascribed by Colonel Semple to the filtered toxins from the contaminated media used in its preparation.

It would really seem, therefore, that Rost's methods have led him astray. At this pitfall of "method" many have stumbled and fallen, and many more will do so; the most expert bacteriologist as well as the partially equipped amateur. Captain Rost is now one of the group of men, many of them of eminence, who have "touched the leper" and repented. He succeeded in cultivating the leper bacillus to his own satisfaction, as several others have done, but it would seem that his observations were awry. Can it be that all the men who believed they had succeeded in cultivating the leper bacillus were wrong in their conclusions? It may be, but there have been so many positive statements that it is difficult to set them aside as of no account. Is it possible that the bacillus can be cultivated only during certain conditions of the bacillus itself, independently of the quality of the medium employed?

Allowing the cultivation of the bacillus of leprosy in a pure medium to be impossible, and, therefore, the preparation of a toxin on these lines unproducible, the fact that the Leprolin used by Rost proved beneficial in cases of leprosy should not be lost sight of. Even allowing that the efficacy of the Leprolin is due to filtered toxins from the contaminated media used in its preparation, the very potentiality of the product may be due to the contamination complained of. It is to be hoped Captain Rost will continue his investigations with the curative agency which he found, and not be damped in his ardour because under certain conditions the leprous bacillus will not grow in certain media. It is unpleasant, no doubt, to publish a piece of work and find it to be wrong, but that the publication is useless is by no means true. Mistakes may benefit the man who makes them, and profit many other men who take up the same line of enquiry. By the mistakes of ourselves and others we learn correct methods and arrive at accurate conclusions, be they positive or negative, and, from a scientific if not from a remedial point of view, the one is almost as important as the other. We hope to hear of further work by Captain Rost in the direction he has so earnestly laboured for the past two years.

Reviews.

THE EFFECTS OF TROPICAL LIGHT ON WHITE MEN. By Major Chas. E. Woodruff, A.M., M.D., Surgeon, U.S. Army. By Lt.-Col. G. M. Giles, I.M.S. (Retd.).

The compliment to a fellow-writer on tropical climatology implied in Major Woodruff's sending me his book, with the view to an expression of opinion on its contents, makes me regret the more that its perusal leaves me unable to agree with its author on many essential points. The following remarks can therefore hardly be based on the ordinary reviewer's point of view, but are, more strictly speaking, somewhat of a controversial character.

As a matter of fact, the work is one that hardly lends itself to review, in the ordinary sense of the word, as it is not a treatise on matters on which there is more or less consensus of professional opinion, but rather of the character of a thesis advancing what is practically an entirely novel view of the causes that render impracticable the colonisation of tropical regions by white men. It will not, it is thought, be denied that the current view of the matter, alike by the profession and the laity, is that high atmospheric temperature is the main hostile agent; the layman regarding this as the sole effective cause, while the medical man recognises that it is so, mainly because warmth favours the development of the low organisms that are the agents of various serious diseases peculiar to hot countries. While admitting that true sunstroke may possibly be due to the action of light on the nervous system, few would regard even this as proven, and apart from this, most of us regard strong light as positively beneficial, more especially on account of its bactericidal action, while gloom is universally admitted to be depressing and harmful.

Major Woodruff, however, attempts to show that light, and not heat, is the main, if not the sole cause of the disabilities of the white tropical resident, and that only those whom Nature has provided with a deeply pigmented skin are fitted to live in sunny

climates. The first five chapters of the book consist of a popular statement of biological and physical facts bearing on the subject. This is followed by a chapter on the "Known effects of light on white men," and the only conclusion to be drawn from it is that we have very little definite information on the subject, as most of the instances brought forward are open to an interpretation quite different from that deduced by the author. He states, *e.g.*, "that the early cave-dwellers of Europe carried on the human species for millenniums in perfect health." This, however, is a pure assumption, for we certainly know not whether they were healthy or otherwise. What we certainly do know is that modern races in the same stage of civilisation are so far from enjoying perfect health that their lives are much shorter than is the case with their well-housed and civilised contemporaries. It may further be pointed out that such races, as well as the darkly housed Irish peasant, use their habitations for little else than to sleep in, and hence their plan of construction can have little bearing on the question of the effects of light. Further, there are unimpeachable statistics to show that the expectation of life of the Irish peasant has greatly improved coincidently with the introduction of a higher standard of housing and of living generally, for "homes little better than caves in the hillside," are fortunately very rare in Ireland at the present day. Again, "The people in the Mediterranean zone live in dark cave-like houses." As a matter of fact, the Italians revel in the sun, and rooms with a southern aspect command a higher price on this account. Nothing struck me more than the way in which the poor of Rome throw open their windows during the day, even in the depth of winter, though at night their hereditary fear of malaria lead them to shun ventilation.

The darkness of the older type of Italian house was a question of fortification, and a necessary outcome of the want of security for life and property, up to quite recent times.

Where plenty of light was consistent with security they took all they could afford of it, so that while the lower floors of the old palazzi are strong and gloomy the upper ones are always amply provided with windows. I do not mean to imply that the Italian works in the heat of the day. No one but an Englishman or American would be guilty of such folly, but they are a light-loving people nevertheless, and the siesta occupies but a small proportion of the working daylight hours. Many pages of this chapter are devoted to the results of actino-therapy, but no prominence is given to the only fact that has much bearing on the question, viz., that this form of treatment has hitherto proved to be perfectly useless except in quite superficial lesions, and that if highly concentrated actinic rays are so easily stopped, it is extremely unlikely that ordinary sunlight can produce any appreciable effects much below the cutis.

This is followed by a chapter on "The blondness of Aryans," wherein the line of argument is much vitiated by the circumstance that the author appears to regard as accepted facts, ethnological speculations which bear the impress of the time when ethnology was regarded mainly from the philological standpoint. That man, for example, had a northern origin, and, what is more surprising, that the negro was evolved from the white man:—that the Aryans were blond. Now all this is pure speculation, and much of it highly improbable at that.

As a matter of fact, no one has any certainty of the home of the people who evolved the Aryan tongue, or what their complexion was. It was a practically useful language, and forms of it have been adopted by widely differing races. Its advanced stage of evolution, however, makes it certain that those who contrived it could have been only most remotely related to the ancestral ape-man, and that they are therefore the least likely of all races to furnish any hint as to the place of origin of the human species. As, however, with the exception of man, no anthropoid has been found except in a tropical climate, it is from the biological standpoint extremely unlikely that man's place of origin was elsewhere. This is followed by a chapter on the evolution of blondness, which opens with the proposition of what the author terms, the "law of cloudiness," "the blondness of a European nation is proportional to the cloudiness of the country." No statistical facts, either meteorological or enthnological, however, are cited in support of the statement, and so far as I know none are available on any sufficiently extended scale as to warrant generalisation. I have a strong suspicion, however, that this so-called law will not bear close examination. In the British Islands certainly the cloudiest part of the country is inhabited by the darkest people. That this dark race have been there a very long time we know, from prehistoric remains. Why, then, have they not evolved blondness or been improved off the face of the earth? In place of this, it is this dark west country type which has secured for England the domination of the sea, and there appears to be a growing impression among ethnologists that they are gradually supplanting the fairer components of the population throughout the islands. As, however, we have no old statistics of complexion, no definite argument can be founded on this impression, which in view of the slowness of such changes (assuming such to occur) cannot possibly claim to rank as a fact for some hundred years or so of exact numerical determination of the components of the population. Aryan migration is next considered, and here, again, the conclusions drawn are necessarily as speculative as the evidence on which they are based, and in many cases open to other interpretations.

The last chapter is the most important in the book and deals with the practical measures to be taken as the outcome of the conclusions led up to. It is so difficult in practice to separate the climatic effects of heat from those of light, and the measures to avoid the evil effects of the one are so usually equally effective in the case of the other, that here one necessarily often finds one's self in agreement with Major Woodruff's teaching, but when it is based on his theory of the absolutely mischievous action of light pure and simple, it is often not only erroneous but positively mischievous, and but for this I should have preferred to remain silent on the subject.

Major Woodruff, for example, regards the healthy tanned complexions of little American and English children as "pathological," and believes they would

flourish even better than they do, if they were afforded an equal amount of air and exercise in deep shade. Regardless of the evil effects of eye-strain, he considers light school-rooms objectionable, even in temperate climates, and it is easy to see that the holder of such extreme views is no safe guide to personal hygiene in the regions ruled by the sun. With the general proposition that deep pigmentation of the skin must help to protect the tissues below from the effects of actinic light no one will be disposed to dissent, but that it is the dominating factor in determining man's fitness to resist climatic influences is quite a different matter, and it is far more probable that this is determined by characters of a far less obvious sort, as yet undetermined.

Man's habit of clothing himself renders him practically independent of the colour of his skin. Moreover, throughout Nature, pigment appears to be determined by entirely other objects than resistance to light, protective resemblance to environment being by far the commonest aim of Nature. So much is this the case that it is a recognised rule among systematic biologists that colour characters should be, as far as possible, avoided in the definition of species. As all other anthropoids than man are arboreal in their habits, it seems probable that the evolving man had a similar *habitat*, and under such circumstances a dark skin would be a distinct advantage in the gloom of a tropical forest, and it is still in such localities that the blackest of mankind are met with; whereas the inhabitants of Persia, which is, perhaps, the sunniest country in the world, are so nearly white men that their pigmentation can be of little advantage to them. The Persian, it is true, affects dark clothing, but that can be hardly the cause of his survival, as shown by the fact that his next door neighbour, the Baluchi, in an equally sun-ridden climate, prefers white, when he can afford it, as also do the Pathans, who are often even fairer than the Persians. Many of the Pathans might be fairly described as blonds, some having blue eyes and quite light or rufous hair, and they live in a land where the sun glares all the year round, and where the summer heat rivals that of almost any part of the world. But in spite of this no more virile race exists. In all probability they exceed even the Irish in stature and are proportionally broad and strong, while no one who has had to do with them can doubt that they are potentially quite the intellectual equals of Europeans.

Fortunately for the other races of Asia their fierce independence of character has prevented the development of any social system compatible with expansion and empire, but within their own borders they have hitherto proved invincible, and their splendid physique, by the way, entirely disposes of another of Major Woodruff's generalisations, viz., that big men are found only in cold, gloomy climates.

That the European cannot colonise the Tropics is, for the present at least, true, and it may be that he never will be able to do so, but the possibility of such achievement is not to be disposed of off-hand by the statement of such facts as a third generation of white settler being unknown in India. The mere fact of continuous residence shows that they must have belonged to the "submerged tenth" of the Anglo-Indian population, and therefore unfit for struggle even among their own surroundings, because every-one who has succeeded sufficiently in the struggle for life sends home his children for education, and that for quite other than climatic reasons, for some of the hill schools are practically as efficient and healthy as the average English establishment. Take the case of my own children. Their parents would prefer to spend their retirement in India, and know that they would run but little risk, either in health or fitness for competitive examination. They would, however, be sneered at throughout life as "belonging to the county families of Missouri," "taking furlo' in a hackney cab," and so on; and what is worse, would acquire an abominable pronunciation of the English language which is practically an indelible brand of inferior social status. For reasons of this sort, the experiment of continuous European residence by families who have proved themselves really fit for the struggle with their fellows has never been fairly tried, and in these days of rapid communication is never likely to be so, but to assume it would fail if it could be fairly tried is a purely gratuitous assumption, and though I personally believe that it would fail I can only regard the facts, as at present available, as having little or no bearing on the question.

What one looked to find, but which is entirely wanting in this book, is definite experimental investigation. For example, what is the amount and character of the sun's rays that succeed in passing through the hands of persons of different complexion? In view of the very non-actinic colouration of the blood, it seems very doubtful if a larger proportion of the shorter waves will be found to pass through the tissues of an European as contrasted with a negro, but so far as I know the experiment has not been tried, though it certainly should be. The effects, too, of different kinds of light on brain tissue is surely determinable by vivisection, at least to some extent, and it appears that points of this sort should have been thoroughly worked out by any one who desires to prove that the world-wide belief in the healthfulness of light is erroneous. In conclusion, let me express to Major Woodruff my regret in being unable to find myself in agreement with his conclusions, but *magna est veritas et prævalebit* is, it cannot be doubted, as much his guiding principle, so that I feel sure he will in no way resent what, after all, is merely an expression of individual opinion.

OBSERVATIONS ON THE FILARIAL EMBRYOS FOUND IN THE GENERAL CIRCULATION OF THE EQUIDÆ AND BOVIDÆ. By A. Lingard. (Adlard, London.)

The parent filariæ are found in the common, anterior, and posterior aortas; other arteries are but seldom implicated. The pathological changes range from fatty degeneration of the intima and media to sclerosis, atheroma, and calcification. Their presence does not shorten the natural term of the life of the host, which is usually calculated at an average period of ten years. The embryos are deposited in the lungs, very frequently in the liver, and occasionally in the kidney, underneath the capsule. They form

calcareous bodies the size of a grain of mustard seed. On section of the affected organ yellow nodules are seen surrounded by a circle of fibrous tissue, the centre being calcarous or caseous, or of the consistency of putty. In the lesions of recent date filaria embryos, or larval forms of nematodes, are seen, while in those of more advanced age portions of their bodies are made out sometimes with difficulty.

Deposition of the embryos in the skin sets up a condition known as bursati, characterised by the presence of indolent ulcers in the skin and subcutaneous tissue, they degenerate and calcify, being then designated kunkur. The ulcers usually originate towards the termination of the hot season, and tend to attain their maximum size during the rains; they may be smooth and almost level with the surface of the skin, but more frequently have a worm-eaten appearance, with light yellow-coloured granules, the encysted embryos. The parts most frequently affected are the lower part of the extremities, and the angles of the mouth, sheath, &c.

The treatment consists in combating the pruritis and healing the sores. If embryos are absent from the blood, the usual life of the parent worms is about a year. The wound may be excised.

Gunn (*Veterinary Journal*, November, 1884) described a pruriginous dermatitis, with the formation of crusts containing worms. Baruchello described a cutaneous helminthiasis due to *Filaria papillosa*, which caused pruritis, cured by an ointment of saturated alcoholic solution of carbolic acid 120 grams, corrosive sublimate 12 to 25 grams, sulphur 400, vaseline 2,000 (*Giorn. di Veter. Militare*, ii., 1889).

Abstract.

THE PREVENTION OF MALARIA.

Abstract from a paper by ALBERT J. CHALMERS, M.D., F.R.C.S.
Ceylon.

(*Read before the Congress of the Royal Institute of Public Health, July 24th, 1905.*)

INTRODUCTORY.

MALARIA is a contagious disease which is spread from one human being to another by means of certain species of Anopheles. The contagion is in the form of definite protozoa living in the blood, and now known to exist particularly in the blood of native children. The parasite is also apt to remain in the blood of natives who, though usually living in a healthy district, have become infected by working in malarious areas. The species of Anopheles known to spread malaria are:—

Anopheles bifurcatus.
,, *maculipennis.*
,, *jesoensis.*
,, *martini.*
,, *pursati.*
,, *vincenti.*
Nyssorhynchus lutzi.
Myzomia listoni.
,, *culicifacies.*
,, *funesta.*
,, *superpicta.*
Myzorhynchus paludis.
,, *constani.*
,, *pseudopictus.*
Pyretophorus costalis.

To the above list may be added a small mosquito, provisionally called *Anopheles kumassii*, which was found in Kumassi during the siege of 1900, and in which the germ was found.

In addition, *Nyssorhynchus fuliginosus* and *Nyssorhynchus maculipalpis* have been noted as doubtful carriers.

The work of Christophers, Stevens and James with regard to the non-carriage of malaria by *Myzomia rossii* is confirmed, and doubt is expressed as to *Myzorhynchus barbirostris* doing so.

The presence of the larvæ of *Myzomia culicifacies*, a well-known carrier of malaria, in the streams and rivers of certain parts of Ceylon, is emphasised as demonstrating the difficulty of dealing with such regions by anti-larval methods. Their presence in wells is also noted, though there is no difficulty in dealing with wells. The ease with which infected Anopheles are found in the Gold Coast Colony of West Africa is compared with the difficulty of discovering them in Ceylon.

THE PREVENTION.

The different suggestions for the prevention of malaria may be classified under two headings:—

(*a*) Those which aim at the prevention of the infection of the Anopheles by man.

(*b*) Those which aim at the prevention of the infection of man by the Anopheles.

(*a*) *Those which Aim at the Prevention of the Infection of the Anopheles.*—The most important point is education. The medical man of this country is educated by the Tropical Schools, but the Ceylon Government had set an admirable example in allowing post-graduate courses of instruction for those of their medical officers whose circumstances do not permit of leaving the colony for such instruction.

The education of the people has been attempted by lantern lectures, illustrated placards in the vernacular, &c., but the important step is the scheme for the teaching of hygiene to the children of elementary schools. The school teachers are drafted at Government expense to Colombo to undergo a course of instruction in elementary hygiene, and are then to teach their children by kindergarten methods, without the aid of any book, elementary hygiene, with special reference to their own particular village. This admirable method, which originated from Sir William Macgregor, of Lagos, is without doubt one of the wisest methods of attacking malaria and other diseases ever instituted by the British Government.

Quinine prophylaxis is strongly advocated for the native population, and the numerous Government dispensaries of Ceylon are cited as the method of bringing the drug to the native.

Malaria should be treated as a contagious disease, and hospitals should have special malarial gnat-proof wards. Especially should hospitals in malarious districts be rendered gnat-proof, and it is a matter of regret that this is so seldom done.

(*b*) *Those which Aim at the Prevention of the Infection of Man.*—The most prominent are those directed against the insect or its larvæ. Reference was made to the fact that natives of Ceylon use various methods to expel mosquitoes from their sleeping rooms, and of Sir Henry Blake's discovery that native medical works

4,000 years old contained references to fever caused by mosquitoes.

Anti-larval methods have proved most useful, for example, those carried out by Ross at Ismailia. In Ceylon the Valikaman district of Jaffna is most suitable for such methods, and a scheme for dealing with this district is at present before the Government. But many districts of Ceylon are not suitable for such methods, which are by no means of universal application, though individuals might do much by personally attending to their own compounds.

The mechanical method of prevention by mosquito nets and wire gauze is strongly advocated. In Ceylon a trial movable gnat-proof hut has been provided for persons compelled to work in very malarious places in the jungle, and it is proposed to render a house gnat-proof. By the experience of the people who live in these experimental houses improvements may be introduced so that future ones may be more comfortable.

Segregation was considered with reference to Accra on the Gold Coast Colony, and was considered to be unsatisfactory on the grounds that it favours one race while it leaves untouched the real prevention of malaria. The highly insanitary condition of Accra a few years ago was explained, and it was considered probable that this insanitary condition of West African towns might be the great cause of the difference in mortality of the malaria there and in such more sanitary places as certain parts of Ceylon. It was pointed out that the isolation of Victoriaborg at Accra separated the European from the insanitary James and Ussher towns, and that this alone might account for the less mortality there than when the European lived in the other towns. It was further pointed out that people living at Victoriaborg often suffered from fevers, and that it had been possible to find *Pyretophorus costalis* in those bungalows. It was also observed that there is always a natural segregation of the poorer from the richer classes which is free from the objections to a racial segregation.

It was considered to be more scientific to follow the methods of the Ceylon Government in :—

(1) Instructing the resident medical men in malaria and other matters.

(2) Educating the people, and particularly the children, in elementary hygiene.

(3) Improving sanitation.

(4) Improving medical treatment of natives and the facilities of obtaining quinine.

(5) Studying the country to find what methods could be best applied to the different regions.

Finally it was considered that no one method would be found so generally useful as a combination of methods, and that more should be done than was at present being attempted.

FORTY cases of beri-beri with three deaths occurred at the St. Louis Exposition amongst the Filipinos present at the Exposition.—*Gazetta degli Ospedali, Milan*, vol. xxv., No. 145.

Correspondence.

TO THE EDITOR OF THE "JOURNAL OF TROPICAL MEDICINE."

SIR,—In the number of the JOURNAL OF TROPICAL MEDICINE for July, 1905, Major G. H. Fink writes as follows :—

"I would draw attention to the following points in Part I. of my book first, before taking up the point regarding membranous opacities :—

"(1) The question of iridectomy is discussed in p. 18.

"(2) The question as to whether the capsule of the lens should be pricked or not is dealt with in pp. 21 and 22.

"(3) The last stage in the coaxing out of the lens is given in pp. 22-26.

"There are two points connected with my operation for cataract which, during my experience, I found most useful, namely, (*a*) the nature and position of the eye speculum ; (*b*) the irrigation of the anterior chamber of the eye with a 1 in 10,000 perchloride of mercury solution which I employed. These two points are given in p. 12 and p. 13 of my *brochure* on cataract above mentioned.

"I mention them because, since my work has been published, I observe that Elliot, of Madras, and another operator of the eye have mentioned these points as if they were original discoveries made by them respectively."

I have never seen or even heard of Major Fink's book, though I believed I had read most of what had been written on cataract in recent years. In any case the statement in Major Fink's last paragraph is certainly incorrect, and, I think, is also unjust and misleading.

To take up his points *seriatim* :—

(1) The question of iridectomy in cataract extraction has been discussed ever since Von Graefe's introduction of "Modified linear extraction," and it would be puerile for either Major Fink or myself to claim any precedence in a discussion which began whilst we were in our cradles or before.

(2) The credit of first using "primary capsular laceration" belongs (I believe) to Drake-Brockman. In the *Indian Medical Gazette* of May, 1897, I most unequivocally gave him the credit for it, which was and is his due.

(3) Major Fink's third reference I am unable to follow.

(4) As to the nature of the eye speculum : I use an old-fashioned type and have never claimed to have invented any speculum. I have pointed out how a speculum should be held so as to avoid pressure on the eye. I did so because I had never seen this point dealt with in any writing on the subject.

(5) Major Fink irrigates an anterior chamber with 1 in 10,000 perchloride. I have never used such a solution for the purpose of cataract extraction. I have always used normal saline solution, following McKeown's advice, and have repeatedly given McKeown the full credit for his method which I adopted.

I wish to state that, so far from desiring to pirate Major Fink's method, I consider the irrigation of an anterior chamber with a 1 in 10,000 solution of perchloride to be opposed to the most elementary principles of physiology. I am surprised to learn that any surgeon can confess to such a proceeding.

The remainder of Major Fink's remarks do not concern me, but I am unable to subscribe to his contention that Major Maynard's criticisms are invalid, because Major Fink had extracted 1,000 cataracts to Major Maynard's 100. It is well known that very often the criticisms of one who has done a few cases and made the most of his material are of very great value. As my own cataract extractions run into thousands I perhaps may be allowed to make this criticism, fully valuing at the same time, as I do, the advantage of operative experience.

Yours faithfully,

R. H. ELLIOT, M.D., B.S.Lond., D.Sc., &c.

Madras,
August 3rd, 1905.

TO THE EDITOR OF THE "JOURNAL OF TROPICAL MEDICINE."

SIR,—I enclose herewith a copy of a representation which I have submitted to the President of the British Medical Association, in connection with the appointment of a Dr. Wunsch, an unregistered medical practitioner of German nationality, as Medical Officer to the British Legation, Tokyo.

It seems to me that the matter is one of sufficient importance to the British medical profession, both at home and abroad, to justify the publication of the facts in the columns of your influential Journal, with a view to enlisting the co-operation of the profession against the grevious injustice which has been perpetrated, and also in order to guard against the repetition of such occurrences in future.

Yours faithfully,
SIDNEY GOMES, F.R.C.S.Edin.

41, *Tsukiji Tokyo*,
July 28th, 1905.

41, *Tsukiji Tokyo, Japan*,
July 27th, 1905.

SIR,—I have the honour to submit the following facts, which I venture to think you will consider of sufficient importance to the profession to justify the Council of the Association in bringing them under the notice of Lord Lansdowne.

(1) In the early part of January of the present year, the position of Medical Officer to the British Legation in Tokyo became vacant. This appointment, which carries a salary of £360 per annum and permits of private practice, was, I understand, sanctioned by the Foreign Office.

(2) Among the applicants were British subjects, registered in Great Britain; but despite this fact the selection fell upon a Dr. Wunsch, who is of German nationality, who qualified in Germany, and who cannot, therefore, be legally registered in Great Britain.

(3) The appointment of Dr. Wunsch to the British Legation is contrary to the provisions of the Medical Act of 1858, Sections XXXI. to XXXVII.

(4) The British Legation is, by international law, British territory, therefore the appointment of Dr. Wunsch as Medical Officer in effect authorises him (though not legally qualified to do so) to practise medicine, surgery and midwifery within the dominions of His Britannic Majesty.

(5) Let me anticipate a very probable reply to those objections. It may be urged that none of the other applicants were considered entirely satisfactory. This would be an excellent reason for not appointing one of them, but will hardly be held to justify the practical exclusion of all the other medical men throughout the British dominions.

(6) It is one of the conditions under which such appointments are held that sufficient notice of intended resignation shall be given by the holder to enable the authorities to find a successor, and as every medical practitioner knows, where an eligible candidate cannot be obtained privately the vacancy is freely advertised in the official *Gazette* or in our official *Journal*. Having been myself in England at the time, I can assert positively that nothing of this kind was done.

(7) Personally I do not desire the appointment. I am a British subject; a member of your Association; a Fellow of the Royal College of Surgeons, Edinburgh; Licentiate of the Royal College of Physicians, Edinburgh; Professor of Surgery in the Charity Hospital Medical College, Shiba, Tokyo; Medical Adviser, Sun Life Assurance Co. of Canada; and am also in practice as a surgeon in Tokyo. My sole desire is to treat this subject without prejudice, and to point out, and if possible get remedied, an injustice that has been done to the British medical profession to which I have the honour to belong and in which I feel an abiding interest.

(8) To appoint a German subject medical officer to a British legation would be (even in the case of one duly registered) to cast an unmerited slur on the entire British medical profession, for it would imply that there was no British subject competent to fill the position.

(9) Suppose it possible that a British medical man had been appointed to the German Legation out here, what would the German press have said?

(10) In conclusion, I beg to point out that the oft-repeated warning uttered by our professors in their inaugural addresses to the British medical schools as to the overcrowded condition of the profession, while very salutary, does not put the matter in a proper light and suggests a wrong remedy. The right one will be obvious from the facts I have stated.

I have the honour to be, Sir,
Your obedient Servant,
(*Signed*) SIDNEY GOMES.

The President,
British Medical Association,
London.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Indian Medical Gazette," May, 1905.

1. The Operation for the Removal of Elephantiasis of the Scrotum and Penis; Notes on 200 Consecutive Cases. By J. T. Calvert, M.B.(Lond.), Major I.M.S.

2. Notes on the Prevalence of Malignant Disease in Bengal. By J. W. D. Megaw, M.B., Capt. I.M.S.

3. Some Remarks on Malaria Prophylaxis. By S. H. Lee Abbott, M.B.(Lond.), I.M.S.

(1) Calvert had only two deaths in 200 cases operated upon. He uses Macleod's method of applying the large rubber cord round the root of the tumour to arrest hæmorrhage; pockets are made for the testicles from the inside of the thighs, the skin-flaps are brought together by silver sutures, skin grafts from the front and inner surface of the left thigh are applied longitudinally along the side of the extended penis, the grafts are kept in position by wrapping two strips of oiled silk about an inch wide and twelve inches long round the extended penis, followed by two long strips of boric lint wrung out of boracic acid lotion and wrapped in wet. This dressing is kept in position by a few strips of twisted gauze tied circularly at intervals. The perineal and pubic wounds are dressed with strips of perchloride gauze, sublimate wool and a figure of eight bandage. The graft wounds in the thigh are covered with a piece of lint soaked in picric acid solution 1 per cent. The perineal wound is dressed on the fourth and again on the eighth day. The penis is dressed on the fourth day, the oiled silk removed and strips of gutta-percha tissue substituted. The smaller tumours were removed without the application of the elastic cord, the incisions being begun below.

(2) Megaw finds that carcinoma is more common among Hindus than among Mahomedans in the Medical College Hospital, Calcutta, there being about

seven times as many cases among the former as among the latter. Although the total admissions of Hindus to Mahomedans were as about three (a little less) to one, the cases of cancer amongst Hindus numbered 64 to Mahomedans 2; scirrhus of breast, Hindus 57 cases, Mahomedans 4; cancer of mouth and pharynx, 49 Hindus to 1 Mahomedan. In reference to the prevalence of preputial cancer, it is to be noted that the Mahomedans alone are circumcised; carcinoma of the skin is quite common in both classes. The incidence of sarcoma in the two classes is almost equal. Taking malignant disease as a whole, the Indian experience seems to show that there is a certain amount of "inevitable" cancer which appears inseparably associated with the general conditions of human existence, but that there is also a certain amount of "avoidable cancer" associated with local and avoidable habits and conditions, the betel (pan) chewing in India seemingly accounting for the extraordinary prevalence of oral and pharyngeal cancer compared with the amount met with in Britain.

(3) Abbott draws attention to the distance mosquitoes can be carried by wind. He believes that he was able to prove that mosquitoes were carried a distance of three miles in a good breeze of wind. Abbott is of opinion that mosquito curtains and guards, not quinine, will give the best results in the matter of prophylaxis.

"Journal American Medical Association," May 27, 1905.

Headache from Malaria.

C. J. Stedman reports a case of headache recurring every forenoon and lasting five or six hours, without temperature. The attacks occurred during mid-winter, whilst the weather was of Arctic severity; no previous history of malaria; malarial spores found in the blood; headache cured by quinine.

"Lepra," May, 1905.

Leprosy in Basutoland.

E. C. Long states that in Basutoland lepers exist in the proportion of 1 to every 1,479 inhabitants (total inhabitants 218,902). He recommends isolation of lepers as the chief means of eradication of the disease.

"Berliner Klinische Wochenschrift," xlii., No. 14, April 3.

Treatment of Tropical and Ankylostomal Anæmia.

O. Liermberger advocates the use of the waters of the arsenic-iron springs of Levico in Southern Tyrol.

SOME EXTRACTS FROM THE CLASSICS.

Quinine. The Jesuit's Powder. ("Burnet's History of His Own Times," vol. ii. Date 1679.)—The King (*i.e.*, Charles II.) was taken ill at Windsor of an intermitting fever; the fits were so long and so severe that the physicians apprehended he was in danger. . . . The fits did not return after the king took quinquina, called in England the "Jesuit's Powder."

Cost of Inoculation for Small-pox.—The devastation of the small-pox when it visits places where it comes seldom is well known. He (the Laird) has disarmed it of its terror at Muach by inoculating eighty of its people. The expense was two shillings and sixpence a head. (Johnstone's "A Journey to the Western Islands," &c., 1773.)

Venereal Disease. (Harris's "Voyages," ed. 1754; "Magellan's Voyage," 1522, p. 13.)—Arrived at Tima. The inhabitants are idolaters and have among them, which is also common to all the Isles of the Archipelago (*i.e.*, the East Indies), the distemper we call the "Venereal Disease."

In Captain Cook's "Voyages" two references are made to venereal disease. In the account of his first voyage it was called the "rottenness" by the people of Otaheite, and was said to have been brought there by the vessels that had visited the island fifteen months before Captain Cook's arrival. In his second voyage we read: "They call the venereal disease *Apa na pretense* (English disease), though they, to a man, say it was brought to the isle by M. de Bonjainville."

Gonorrhœa and soft chancre were doubtless with syphilis included under the heading of "venereal disease," but it is probable that these several accounts refer especially to the latter; the "rottenness" suggests phagedænic ulceration.

J. Burton Cleland.

Notes and News.

Malarial Gastro-intestinal Hæmorrhage.—D. Scozzate describes a case of malaria, in which the patient vomited blood and passed blood by the anus. The condition was cured by quinine.—*Deutsche Medizinische Wochenschrift*, vol. xxxi. No. 11.

Filariasis in Kamerun.—H. Ziemann states that *Filaria perstans* occurs in the blood of Europeans in Kamerun, and in proportion as they were infected so were they affected by local swellings of temporary character and by multiple abscesses.

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Original Communications.

NOTES ON SOME METHODS EMPLOYED BY KELANTAN MALAYS IN THE TREATMENT OF PURU OR YAWS.

By John D. Gimlette, M.R.C.S., L.R.C.P.
Medical Officer to the Duff Development Co., Ltd., Kelantan, Malay Peninsula.

The communication which I had the honour of making to the Therapeutical Society was based on notes which I have made from time to time on Yaws as it occurs in this part of the Tropics. A period of over seven years' service in the Government of the Federated Malay States has afforded ample opportunity for observing yaws or "puru," the latter being the name given to it by natives of the Malay Peninsula. A further and better opportunity for observing this disease under purely native conditions has been afforded me during the last year by a residence in the interior of Kelantan. The State of Kelantan is north of Pahang, and approaches Siam, being in geographical position between 5·40° and 6·20° N. lat. The country, until quite recently, has been administered by a native Malay Rajah.

Puru is very common, both in the towns and villages of Kelantan. It belongs equally to the native palaces and to the poorer dwelling places. The disease is identical with that so clearly described by Charlouis as occurring in the islands of the Malay Archipelago.[1] The identity of puru with yaws has been pointed out by Barker, of Borneo.[2] It is not necessary, therefore, to review in this paper the mass of evidence which proves the identity, and which adds so many other native names to the nomenclature of framboesia or yaws.

The disease is spread all over the Federated Malay States, viz., all over Perak, Selangor, Pahang and Negri Sembilan. It is chiefly confined to the Malay population, being especially common among children in the less civilised of the States, *e.g.*, in Pahang.

So far, its prevalence has not attracted much attention from the Government of the Federated Malay States. This is probably owing to the fact that it does not interfere much with labour (which is mainly carried on by Chinese) and, speaking generally, it does not permanently injure the health of the Malay community. Death from an ordinary attack of puru is almost unknown.

As in other tropical countries in which this disease is prevalent, an attack of puru or yaws is generally considered by the inhabitants to be a salutary experience for their children. Inoculation is not, however, practised by Malays, and although the high degree of contagion is well known to them, isolation is never thought of, but natives will avoid personal contact with the discharges of yaws, and do not care to eat rice with people who may be afflicted with the general eruption. The chronic sores of the foot (puru duriyan) —the so-called "durian sores," of Kelantan (known as "bubal" in the other states), are not considered to be infectious, but Malays are careful to bathe up stream or away from people who are engaged in washing either their sores, or those of their sick children, at the time.

There is a belief amongst some of them that the blister caused by accidental contact with the "getah," or fresh sap, of a common local jungle tree called pokoh machang, the horse mango (*Mangifera fœtida*), is a ready vehicle for infection by puru, should there happen to be cases of the disease in the neighbourhood. These trees are sometimes avoided in consequence, especially in August, when they are in fruit, except by those who think that they may have secured immunity owing to repeated attacks of puru in childhood.

In the early stages of the disease the only native form of treatment employed for the relief of the prodromal fever and muscular pains is the superstitious Malay practice of "menjampi," or charming by incantations. It is held by Malays that active treatment is of no avail until the full development of one or more puru sores has been attained. The sore which is so often watched, with the object of timing the commencement of treatment, is known to them as the "puru ibu," or mother sore. When this so-called parent sore has developed, their most valued remedy is the external application of a latex, or kind of gum, which is called "getah agu" in Kelantan, or "getah jintan" in Pahang Malay. This is obtained from a climbing jungle creeper known in Kelantan as "akar agu" (*Akar, lit.*, a root, the generic name for scandent or creeping plants). The agu plant grows wild. It is very like *Hunteria corymbosa*, but is uncommon. It is prized by Malays, and, like many other of their medicinal plants, is protected and cared for. A red variety is especially valued. The latex is obtained by cutting the live stem, mixed with water, to allow for its inspissation, and may be bought in this form in the native market at Kota Bharu. The remedy is smeared day by day on to the sores of the general eruption. So far as my limited clinical experience in Kelantan goes, "getah agu" causes the sores of puru to shrink, and is of value as a local application.

Another latex which is valued is obtained from a jungle creeper called "akar gam." In this case the remedy is obtained by incising the fresh fruit, but it can also be procured by incising the stem. It is generally known under the name of "buah gam" (*Buah, lit.*, a fruit) and is commonly applied to the sores of puru in the same way as "getah agu." In some cases in which the sores are chronic and do not respond to treatment "buah gam" is applied in a different way. The dry fruit is roasted, then powdered, and finally made into a paste with a little water. In some cases of chronic and recurring sores the ashes obtained by burning the stem of "rotan sega badak" (*Calamus ornatus*) are used. Rotan in Malay is a generic name for rattans of the genera calamus and dæmonorops.

Another local Malay remedy is well known under the name of "terosi." This is sulphate of copper. In the general treatment of puru "terosi" is reduced to powder and then mixed either with palm oil, or with a latex called "getah pulai." "Getah pulai" is obtained by cutting the stem of the young pulai tree. This is a large jungle tree (*Alstonia scholaris*),

External applications of this kind containing "terosi" cause a great deal of pain. They prevent sleep and are not often used on this account, rarely, if ever, being employed in the early stages of puru. With the object of preventing pain, these applications are sometimes prepared by first burning the "terosi" in a slow fire until it is blackened; then pulverising and mixing into a paste by means of the juice of the common lime fruit—limau nipis (*Citrus acida*).

A more important drug, for sale in the Kota Bharu market, is "tebah tikus" (*tikus*, a rat), which, like "terosi," is imported *via* Singapore. "Tebak tikus" is pure arsenious acid, or "white arsenic;" it assumes rather odd forms, which are probably due to its having been collected from the flues of some dyeing works. It is used externally in the treatment of puru either by itself in the form of a powder, or as an addition to various kinds of roughly-made "pastes" which are prepared from certain native plants. These vegetable "pastes" are freshly made as occasion demands; in one instance by grinding down with a little water the root of a wild, red vine, called in Malay mali puchok merah, a plant which is identical with Leea rubra (*Merah, lit.*, red), and in another case by treating in the same way the root of a low shrub called manis (*Sauropus albicans*). Manis is the Malay for sweet or light in reference to some colours.

"Tebah tikus" is used as a poison by criminals, but it is not administered internally as a medicine by Malays. It is the "berangan puteh" of Java, being probably brought from Siam or Burma. The sulphurets orpiment and realgar are also used in puru, but all the external applications containing arsenic, being caustic, are much disliked on account of the pain which they occasion.

Mali puchok merah is given by the mouth for puru as well as being used externally, and among other internal remedies are Melor hutan, a wild jessamine (*Jasminum bifarium—Oleaceæ*), and the black variety, of Kemantu. This latter is a tree of Indian origin (*Clausena excavata*). It is called pokoh kemantu hitam, or the black kemantu tree, pokoh meaning a tree in Malay, and hitam, black. There are other varieties of this tree which are not used in medicine. Akar jelar batu is also administered internally for puru. In each case the roots of these plants are ground down on a "batu asah" (a stone on which medicines are pounded or ground down) and then infused in cold water. There is no fixed dose. Occasionally a mixed infusion is used in puru of kemantu hitam and Tuko takal (*Baccaurea wallichii, Euphorbiaceæ*) a jungle tree which is fairly common.

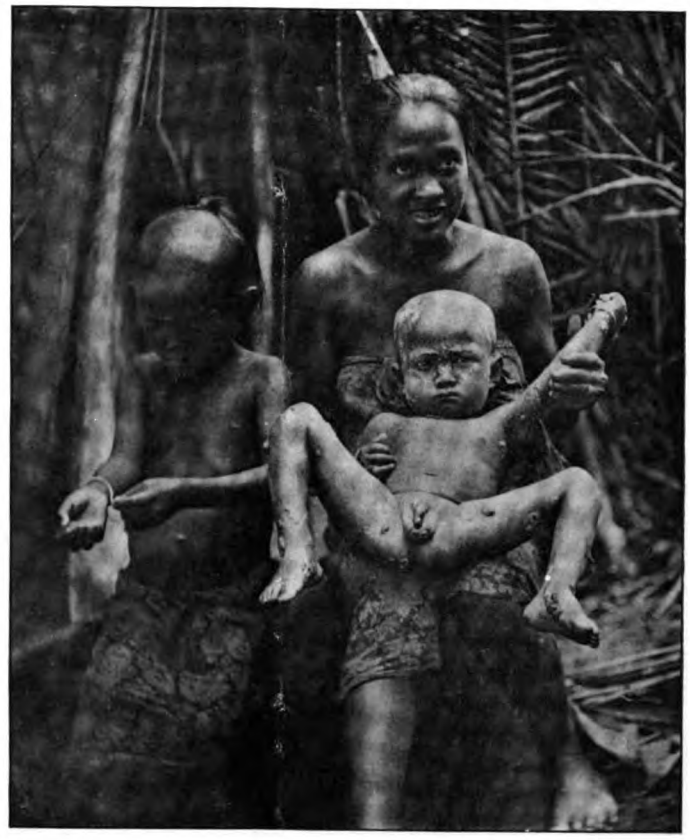
Various applications are made for puru of the foot. The following method of treatment, known as "tanak puru" (*tanak, lit.*, to cook), is a favourite one with some Kelantan Malays. A small round hole about a foot in depth is made in the ground, and a slow fire is kindled at the bottom of it; half a cocoanut shell with a hole in it, or a suitable piece of bamboo, is then fitted over the red-hot embers. The affected foot is rested on the top of this improvised screen in such a way as to expose the sore to the heat of the smouldering fire. Kemantu leaves are often put on the fire as well as those of Kedondong, a tree belonging to the genus Canarium. The bark of the latter is sometimes burnt on the embers in addition to the leaves. Relief of pain is obtained after three or four lengthy exposures. Lime is also a popular remedy for puru of the foot. It is mixed with oil or with the juice of "keladi puyoh," a common Malay aroid of the genus Alocasia (*Typhonium roxburghii*). Stones may be heated and applied as hot as can be borne. The actual cautery in the shape of a red hot nail is occasionally used, and even excision is attempted by means of "parangs," or the rough iron choppers which are usually used by natives in felling trees.

It is of general interest to note that the drugs used in puru are not used by Malays in their treatment of syphilis. Syphilis is universally believed by them to be entirely distinct from puru. In Kelantan, syphilis is well known, being recognised under the local term of "seduwan sundal" (*sundal, lit.*, a barefaced harlot). The chief Malay drug used for syphilis is pokoh restong (*Tabernæmontana corymbosa*). Pokoh restong grows wild, but is often cultivated; it is praised by natives as being a valuable medicinal product. The root is used and mostly in the form of a lotion, especially in cases of ulceration and destruction of the nose. It, as well as "trong pipit puteh" (*Solanum indicum*), is also given internally for syphilis, but neither of these is employed in the treatment of puru or yaws. Trong is a malay word used to designate the plants of the Solanaceæ (*puteh, lit.*, white).

In conclusion, the apparent influence of vaccination as a preventive method of treatment must be mentioned. It has been noticed by the Malays in Pahang. Although Keelan[3] from experience in Dominica, has referred to the apparently favourable connection between yaws and vaccination, his suggestions do not appear to have entirely fallen in with the views of other West Indian observers, but still, at first sight, the incidence of the disease, as it occurs in the Malay Native States, seems to support his original ideas. Judging from the scars of "puru ibu," which are as well remembered by Malays in after life as vaccination marks by Europeans, Puru has evidently been prevalent in Kelantan for many years.

It is significant to note that vaccination has never been attempted on any large scale in this uncivilised State. In the advanced States of Perak and Selangor, on the other hand, where the mixed populations are now more or less thoroughly protected by vaccination from small-pox, yaws is becoming comparatively uncommon. Puru, again, was very prevalent in the State of Pahang nine or ten years ago and this has been followed by a marked decline. Prior to 1896 there were only 13 cases of vaccination in the Pahang Annual Medical Reports. At the present time the registered number has probably far exceeded 20,000 cases. The Malays of the Federated Malay States now believe in vaccination. They often attribute an apparent immunity of Europeans to puru to the fact that speaking generally all European residents have been well vaccinated in childhood. This view is probably erroneous. There seems to be a better reason. Dr. C. W. Daniels (the Director of the Institute for Medical Research, Federated Malay States) tells me that European children of the lower classes mix freely with native children in Fiji and in the West Indies. They are

Musah, one of the Resident's boatmen.—Puru duriyan of hands and foot, acute, ill 14 days. He had Puru in childhood, no history of syphilis. Photographed at Kota Bharu, August 14, 1904. Now cured October 20, 1904.



Puru siput ("*siput*," *lit. a shell*).
Photographed at Kota Bharu, September, 1904.
Kelantan villagers.

Puru mata kerbau
(mata, lit. an eye; ker'au, a buffalo).
Photographed at Kuala Takar, August 8, 1904.
Kelantan villagers.

Puru siput.
The children of Tengku Petra Semara, a Kelantan Rajah. No history of syphilis, ill three months. Photographed in his palace at Kota Bharu. August 15, 1904.
Kelantan natives.

To illustrate article by John D. Gimlette, M.R.C.S., L.R.C.P., on "Notes on some methods employed by Kelantan Malays in the treatment of Puru or Yaws."

in this way directly exposed to the contagion and often suffer from yaws in consequence. It would be quite exceptional, on the other hand, for European children to have many native playmates in places where puru is common. Good opportunities for mixing freely with children of their own age in the native towns and villages of Malaya are seldom given them. It is more practical to account for the apparent immunity of Europeans to puru by explaining that they are not really very much exposed to the contagion. As a matter of fact, most Europeans are rather prone to avoid contact with this loathsome disease.

Referring again to the alleged influence of vaccination, it must also be borne in mind that it has not yet been actually proved to exist in the other warm climates in which yaws is common, and it must be remembered that the principles of sanitary science have been introduced by the Government of the Federated Malay States coincidentally with the introduction of vaccination into the older States of Perak and Selangor, and extended more recently into the State of Pahang. The intrinsic value of vaccination, if any, as a preventative to the occurrence of the disease in Kelantan, where the people are ignorant of the principles of modern sanitation and are exposed to epidemics of small-pox, remains yet to be seen.

I am much indebted to Mr. R. W. Duff for his kindness in helping me to prepare these notes, and to Ungku Saiyid Hussein (a Malay noble), for his cordial collaboration. Botanical specimens of most of the plants referred to are sent with this paper to England, in the hope that they may be of interest to the Therapeutical Society. They have all been obtained in Kelantan; most of them from a hamlet—Kampong Kutan—near Kota Bharu (the Capital), others from different parts of the State. These drugs are used empirically, and, speaking generally, are well known to most Kelantan natives, but Malays are naturally reticent, and it is not easy to win secrets from the native "pawangs" (witch doctors), or to obtain information from the "bomors" or medicine-men, by which to differentiate their particular therapeutic virtues. I am indebted to Mr. H. N. Ridley, F.L.S., the director of the Botanic Gardens, Singapore, for his kindness in classifying the plants, and to Mr. P. Burgess, M.A., Government Analyst, S.S., for his examination of the mineral known as "tebah tikus," or ratsbane.

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ZAMBESI ULCER.

By L. E. ASHLEY-EMILE, L.R.C.P., L.R.C.S.Edin., L.F.P.S.Glas.

Definition.—A phagedænic ulcer of hitherto undefined origin, occurring in certain parts of tropical and sub-tropical Africa, and characterised by extensive necrosis, and sometimes great deformity of limb.

Geographical Distribution.—Is wide-spread, occurring, as its name implies, in Zambesia, particularly in the province of Mozambique, where it is recognised as Mozambique or Zambesi Ulcer. The ulcer is also met with in adjacent parts of Africa north and south of the Zambesi River. In East Africa the ulcer was known to the early explorers, Speke, Burton, Cameron, &c., who themselves and their followers suffered greatly from it, while the immortal Livingstone also suffered from these troublesome ulcers during his journey up the Zambesi.

South of the Zambesi these ulcers have different names, dependent upon the locality where they happen to be contracted. On the south-eastern coast they are known as "Delagoa Sore," in Rhodesia "Rhodesian Sore," in Natal "Natal Sore," while in the Transvaal and other parts of South Africa the nomenclature changes to "Veldt Sore."

Etiology: Age.—As the greater bulk of the native population residing in these parts have at some period suffered from these ulcers, I am inclined to think, after repeated attacks, immunity is afforded, since these ulcers are scarcely ever seen on aged persons. Adults of both sexes, and even children, are most susceptible to them.

Race.—Race does not afford any immunity. The natives are more frequently attacked owing to certain predisposing factors in their personal environment which renders them more susceptible, while the whites, residing under similar unhygienic surroundings, soon acquire them.

Social Conditions.—Labourers and others working in plantations who constantly walk through jungle or bush are easily affected, while those whose occupation necessitates confinement indoors generally escape when the ordinary precaution is taken in the matter of their dwellings, for in the Zambesi Valley most houses are built of bamboo and reed, with plank floors, which form suitable nidi for the breeding of all germ life, and those that effect an entrance from without are difficult—if not impossible—to eradicate, hence constant supervision is required in maintaining these huts habitable. Dress also plays an important *rôle:* persons whose extremities are unprotected by suitable boots and leggings invariably contract them.

Personal Conditions.—All debilitating causes, such as malaria, alcohol (C_2H_6O), by undermining the system, are the most potent factors in the rapid spread and break down of the ulcer into the phagedænic type.

Exciting Causes.—Hitherto the cause of these ulcers has not been described by any one. On referring to Dr. Manson's valuable book on Tropical Medicine under the heading of "Sloughing Phagedæna," he states: "Cause unknown, probably due to saprophytes." I may, then, lay claim to the unique distinction of being first in the field in bringing to notice the cause of these ulcers, which has hitherto remained in obscurity, and evaded elucidation by many eminent observers in tropical medicine who have resided in Zambesia.

During my sojourn there, I extracted from the leg of one of the white engineers employed in the sugar plantation certain grubs which I brought down to Capetown for examination. Mr. L. Peringuey, Assistant Director of the South African Museum, very kindly examined them for me, and pronounced them

to be the larvæ of a dipterous fly, analogous to that described by Blanchard. A translation from his paper, in French, describing these larvæ is as follows:—

"I have already alluded to the larva of a muscid fly extracted by Dr. Kirk (Sir John Kirk) from the leg of a famous explorer, Livingstone, during his journey to the Zambesi. This larva, which was given by Kirk to Cobbold, was deposited by him in the collection of the Royal College of Surgeons. It is there now (bottle 196). We have been able to examine it, and have been able to have it drawn. It is entirely white, 5 mm. long, 2 mm. wide, somewhat depressed, and without hooks either round the mouth, or on the surface, or the segments. The latter have scattered spinules seemingly irregularly set, and not numerous. The head is not very distinct, and the eleventh ultimate segment is provided in its median part with two stigmatic orifices. It is quite plain that this larva is not much developed, and that it belongs to the Muscidæ, but one cannot be certain of its affinities."

The larva discovered by me is totally unlike the grub of *Bengueyella depressa* deposited on the body of man, or even it is said of dogs in Natal, the Transvaal, Delagoa Bay, and also in Senegal.

Habitat.—After several fruitless attempts to locate the habitat of these larvæ, I was fortunate enough to discover in the long grass on the banks of the Zambesi a specimen identical with that extracted from the ulcer mentioned above. I am, therefore, of opinion that the long grass is the natural situation of these larvæ while undergoing the various metamorphic changes.

Mode of Infection.—This takes place in two ways. (1) Directly, *e.g.*, when walking through grass or bush the larva adheres to the naked legs, and thereby effects an entrance. Natives are chiefly affected in this manner. (2) Indirectly, when it adheres to the clothes or boots and is carried into dwelling places and there deposited either by native servants or others working in fields and plantations. Carelessness on the part of persons in walking about barefooted brings about infection. The larva soon adheres to the naked surface, and rapidly burrows beneath the skin.

Progress after Invasion.—The larva having adhered to the skin by means of its spinules rapidly burrows beneath the epidermis into the subcutaneous tissue, preferably along the root of a hair follicle, where it lies coiled up embracing the hair root. In appearance it resembles a pimple having a central black spot, and when rolled beneath the fingers feels shot-like. This stage—which may be termed the stage of invasion—generally takes about twelve hours, at the end of which period the larva excretes a pale yellow fluid which has marked irritant properties, and which gives rise to great irritation, resulting in the formation of a hyperæmic areola round the papule. The central black spot, which is the embedded larva, now disappears under the superficial fascia, leaving a small vesicle in its place—the fluid being the excretion given off.

The only prominent symptom at this stage is intense itchiness, which requires great resolution on the part of the patient from scratching it. The vesicle gradually enlarges, and if unruptured prematurely attains the size of a small marble. The vesicular stage lasts for about three to five days.

Ulcerative Stage.—After the bleb has burst, a small circular opening is seen in the superficial fascia, plugged by a thick yellow discharge consisting of broken-down *débris*. On passing a probe into the opening, one is surprised to find that the instrument passes into a funnel-shaped cavity for at least half an inch in depth, the base of which is about an inch in diameter, the roof consisting of the superficial fascia, which is now rapidly undergoing disintegration. At the end of the first week the superficial fascia gives way, leaving a circular ulcer about half an inch in diameter with sharply-cut margins. During the second week the ulcer becomes fully established, and attains its distinctive characters, being circular in shape, the margin is smooth, elevated and indurated with sharply-cut edges, slightly insensible to touch, and surrounded by an areola of congestion, dusky red in appearance. Beyond the areola the part is œdematous, spreading for a long way up the leg. The base of the ulcer is very characteristic—it has a hollow, punched-out appearance of a bright red colour, very irregular, due to the entire surface being studded with small papillæ which vary in colour from greenish blue to bright red, and fleshy looking. Each papilla at its apex presents a crypt through which the broken down *débris* is discharged in the form of a thread-like process very similar to mycelia. These processes are yellowish-white in colour, soft and cheesy in consistence, and best viewed when the leg is immersed in water, when they spread out, and can then be easily traced to the underlying crypt in the papilla. These processes with epithelial cells and pus corpuscles constitute the slough, which forms a stringy, gelatinous, adherent mass. When scooped away, the ulcer presents a red surface studded with white points, the latter being the remains of the processes at the apex of the papillæ. These points are of great importance, both from a diagnostic and therapeutic point of view. Should the ulcer remain untreated, the underlying muscles become involved in the necrosis and slough away, leading ultimately to the destruction of the periosteum and denudation of the bone. The resulting deformity which takes place in these severe cases is due chiefly to muscular action, since the extensors are invariably affected, the flexors alone acting produce a kind of *Talipes equinus*.

Site.—The most favourable situation for these ulcers is the lower third of leg on its anterior aspect. The dorsum of foot, middle third of leg and thigh, follow in order of invasion. I have never seen a typical ulcer on the body or upper extremity, which fact is not now so surprising after our recent knowledge of its etiology.

Symptoms.—The symptoms are rather vague and ill-defined, occurring as it does in malarious countries, the few symptoms engendered by the ulcer are masked by those of malaria and its complications. The most prominent symptom, however, is intense itchiness, which is most distressing to the patient, since it is more severe at night than in the day, and thereby preventing sleep and inducing loss of health and debility. Pyrexia is felt during the ulcerative stage.

Diagnosis.—To the young practitioner arriving in

the Tropics for the first time, and unacquainted with the nature of these ulcers, the diagnosis is extremely difficult, in the great majority of cases his examination being superficially conducted, especially where natives are concerned, and his results based entirely on inspection, when the circular shape, indurated margin, sharply-cut edges surrounded by an areola of dusky redness and invariably situated on the lower third of leg, facts which present a picture only too familiar, that the unwary observer, without further consideration, pronounces in favour of its specific origin, and the unfortunate patient is submitted to a vigorous mercurial treatment—alas! with disappointing results. Only by careful examination of the base, by removing the slough when the characteristic white points, the remains of the processes at the apex of the papillæ, are seen, then the true nature of these ulcers is distinguished.

Having once appreciated the appearance, the observer is unlikely to repeat the pardonable error of his previous diagnosis.

Zambesi ulcers have often been mistaken for Scorbutic Ulcers. The absence of the usual characters of the latter, viz., the spongy, dark-coloured, strongly-adherent fœtid crust, the removal of which is attended with free bleeding and followed by the rapid reproduction of the same material, and the absence of scorbutic symptoms elsewhere, should present little difficulty in differentiating between them.

Prognosis.—Is very favourable if treatment is undertaken in the early ulcerative stage before the necrosis has extended to the underlying muscles. The chronic nature of these ulcers must be borne in mind and duly impressed on the patient. The native mind will, however, find it difficult to grasp such a fact, and after submitting to treatment for a week, and not noticing phenomenal results from the white doctor's medicine, invariably seek consolation in their own method, which consists of plastering the ulcer over with a paste made from the leaves of the Neem Tree ("Pride of India,") which thrives in the Zambesi Valley. I have seen some good results follow its empirical use. In those less fortunate cases where, from lack of proper treatment, all the soft parts are destroyed, the prognosis must necessarily be unfavourable as far as regeneration of tissue is concerned, the resulting deformity then being inevitable.

Healing Process.—The reparative process is in direct proportion to the extent of necrosis and destruction of the soft parts. The average duration, however, is from one to two months. When suitably treated four distinct stages are apparent, which should be carefully noted as indicating the index of progress of each case.

First Stage.—The slough alters in character. Instead of the thick adherent mass, it assumes a more liquid form. On minute examination, the *débris* previously seen in the form of processes loses its homogeneous character and undergoes disintegration. The epithelial cells diminish and pus cells predominate, and the entire discharge is reduced in quantity. The base has a mottled appearance, and the papillæ stand out prominently.

Second Stage.—The papillæ are absorbed and disappear. The base presents, instead of the previous mottled appearance, a uniform red surface.

Third Stage.—Granulation tissue makes its appearance. At first the granulations are large, flabby, semi-translucent and friable, breaking down readily from excess of indolence, and being replaced by healthy granulations. The base is level, or nearly so, the edges are smooth and shelving, and extend in the form of a bluish-white film over the marginal granulations, the surrounding cellulitis rapidly subsides.

Fourth Stage.—After the ulcer has healed over and the granulation tissue converted into fibrous tissue, this latter contracts, leaving a slightly depressed cicatrix surrounded by a pigmented surface.

Treatment.—Prophylactic. In view of our knowledge bearing on the habitat of these larvæ, every endeavour should, if possible, be made to avoid walking through the long grass and dense bush in these regions. Labourers and others working in plantations should wear boots, and have their lower extremities well protected by means of suitable leggings or putties, which should be taken off in a separate apartment after the day's work, and the clothing well brushed. The habit of walking about barefooted should in all cases be discountenanced. Floors of apartments should be kept scrupulously clean, and scrubbed with Jeyes' Fluid, or any other disinfectant, at least once a week.

Curative.—In the early stage, when the larva appears as a central black spot embedded in the pimple under the skin, it can be quickly extracted by means of a needle or sharp pointed instrument. Since it adheres tenaciously by means of its spinules, a little care and patience is needed in dissecting it out *in toto*. After it has burrowed through the superficial fascia, extraction is well nigh impossible. It should then be destroyed by means of some powerful germicide, for which purpose I prefer the crystals of permanganate of potassium, rubbed well into the little wound. When the ulcer is fully established, the best plan is to anæsthetise the patient, and scrape the base of ulcer, taking care to remove effectually all the papillæ until no more white points are visible. The ulcer should then be cauterised with pure carbolic acid and dressed in the usual manner.

In those cases where the above plan is inadmissible, I have found the following just as efficacious, though the reparative stage is more protracted.

After removing the slough, the limb is immersed in warm perchloride of mercury lotion for at least fifteen minutes daily. The papillæ are destroyed by touching them with sulphate of copper crystals, and dressed with the following ointment:—

℞:	Sulph. Sublimatis	grs. xx.
	Acidi Salicylici	grs. xxx.
	Zinci Oxidi	grs. xxx.
	Amyli	grs. xx.
	Vaseline	℥j.

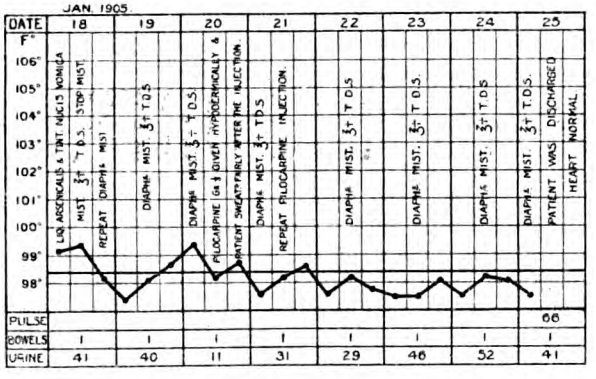
The French Académie de Médecin has awarded, through the Minister of the Interior, a silver medal to Dr. Alan Green, Bacteriologist in charge of the Vaccine Lymph Department, Lister Institute of Preventive Medicine, for his work on Vaccine, published in the *Proceedings of the Royal Society*, and in the Report of the Medical Officer, Local Government Board.

ON THE EFFECT OF PILOCARPINE IN BERI-BERI (WET TYPE).

By P. N. Gerrard, B.A., etc., Dublin, D.T.M.H. Cantab., District Surgeon, Krian, Perak.

Chan Sing, Chinese, M., 38, a miner, Reg. No. 2,155, eight years in the F.M.S., was admitted to the wards of the District Hospital, Larut (Taiping), on October 17th, 1904. From the 17th afternoon till the morning after his admission he had passed five motions containing blood and mucus.

He was diagnosed dysentery, and put on the French treatment (mag. sulph., &c.). The dysentery did not yield, however, and the treatment was changed on the 20th to pulv. ipecac. co. and bismuth, the frequency of the motions diminished to three daily, but as the mucus continued to appear in the stools he was put back on mag. sulph., with formalin added; this caused no improvement, and after two days, *i.e.*, on the 24th, he was again changed on to salol, bismuth, and Dover. This caused a diminution in the number of the stools from 3 to 1 or 2 daily, but on 27th blood again appeared in the motions, and ipecac. c̄soda was exhibited.



From that date, October 27th, until November 29th the "changes were rung" on mag. sulph. pulv. ipecac., ipecac. and opium pills, santonine, quinine in various combination, until, on November 10th, he was put on pil. hydrarg. with ipecac., which apparently started an improvement in his condition, and on the 29th his dysentery (?) was to all appearances cured.

On December 3rd incipient beri-beri was diagnosed, and some pretibial œdema appeared. A creasote mixture was exhibited which caused some improvement in his general condition, but had no effect upon the œdema. On the 7th the urine had diminished to 26 oz., and the œdema was more boggy. On the 11th he passed 61 oz. urine, but the œdema continued to increase. The creasote mixture was stopped on the 12th, and a calomel purge given, his œdema on this date being "very soft and boggy," pulse very slow, and urine only 34 oz. in 24 hours. On 19th some mucus appeared again in the stools, and castor oil was given, followed by thymol, no anchylostoma or other ova were discovered.

On the 20th the creasote mixture was again commenced, but as it caused an aggravation of his general condition on his own showing, it was permanently stopped on the 14th, and a mild diaphoretic mixture prescribed with $\frac{1}{8}$ grain pilocarpine hypodermically. This was repeated on the 26th, 29th, 31st, the doses being $\frac{1}{6}$ grain on the 26th and 29th, and $\frac{1}{3}$ on the 24th and 31st.

On January 3rd the note on his condition reads: "Œdema subsiding rapidly; mitral murmur still present."

On January 5th pilocarpine was repeated, and on 9th there was no œdema perceptible.

On January 11th, his improvement being maintained without further treatment, he was given an arsenic and nux vomica mixture as a tonic preparatory to his discharge, but on 18th the œdema reappeared, the temperature rose to 99·4, and I considered it advisable to recommence the injection and diaphoretic mixture. He had $\frac{1}{8}$ grain pilocarpine daily from that date, and on January 22nd the œdema was "hardly perceptible." On January 25th it had disappeared, and his heart sounds were normal, his pulse 66; he was able to walk, run, and jump an 18-inch iron bar, and he was discharged at his own request.

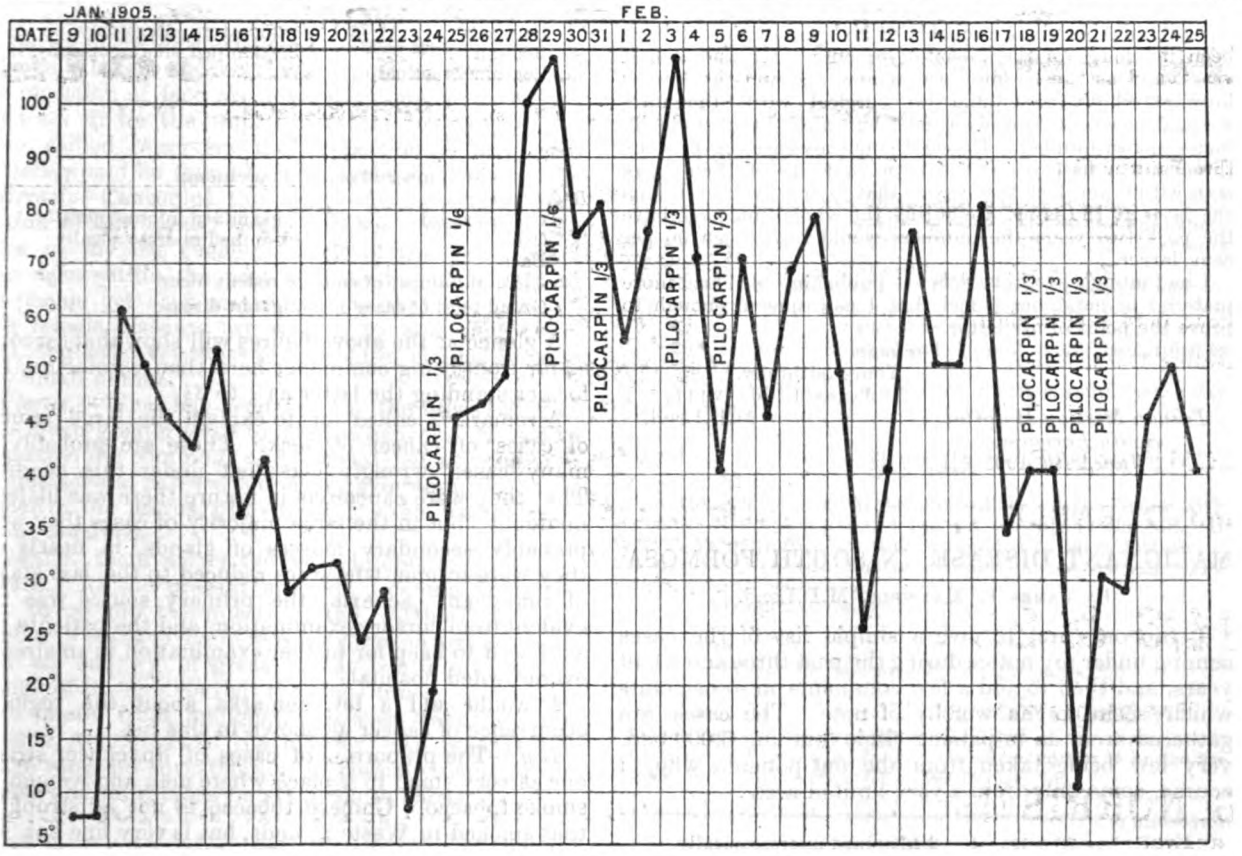
While keeping in mind the fallacy that upon one case no general argument can be based, I nevertheless desire to give this case publicity, not so much on account of any novelty in the treatment, which man have been adopted before, but rather as a type of a series of similar cases which I have recently had at the District Hospital, Taiping, in the beri-beri wards, and, furthermore, I regret to say, because this case is one of the only well-written-up cases in the series.

Several interesting points and speculations suggest themselves on looking through these notes. Firstly, perhaps, the prolonged obstinate discharge of mucus, and occasionally blood, per anum. Was it dysentery, properly speaking? By which question I mean to ask, Was it a disease of the intestines caused by the amœba histolytica coli, or the bacilli of dysentery (Shiga, Flexner, &c.), or was it an inflammation due to some slower acting micro-organism, or to an irritative toxin?

We now know that in beri-beri the stomach, and intestines almost through their entire length, are affected, and that there is really no substantial reason to prevent us from specifying beri-beri as a disease caused by an acute intestinal intoxication, and, again, the fact that cases of irregular dysentery very frequently result in beri-beri here (where beri-beri is endemic) would point to the original disease in this case being a beri-beric enteritis and colitis. The intestinal inflammation taking place on the invasion of the intestine by an organism or on account of an irritating toxin circulating for some time over the mucous membrane, the absorption of the products of which organism or toxin eventually accumulated to produce the neuritis.

But the most interesting point about the case is, I submit, the rapidity with which pilocarpine acted upon not only the œdema but apparently the disease itself, almost as if it had caused the secretion in the urine and sweat of the toxin.

On December 24th, pilocarpine was first administered, and on January 3rd, that is ten days later after he had had five injections only, we find in his bedside notes: "Œdema rapidly subsiding," and on January 5th, after his sixth injection, the œdema was "slight."



On the 9th he had no "pretibial œdema." His attempted relapse, which started on January 18th, was completely aborted by four injections, one on each successive day (18th, 19th, 20th, and 21st), and on the 25th his condition was apparently normal. Another point of interest arises in connection with the relapse, he lost ground immediately he was put on arsenic and nux vomica, and after eight days of this mixture, during which time he continued to pass plenty of water, his œdema reappeared, and on stopping the arsenic and again administering pilocarpine he regained to normal in four days.

The average amount of urine passed during the fourteen days before pilocarpine was 35·7 oz. per diem; whilst getting an hypodermic of $\frac{1}{3}$ grain every other day (December 24th to January 6th), the daily average amount passed was 72·7 from 5th to 17th (no pilocarpine), the average was 57 oz. per day, and from the 18th to the 21st, while under pilocarpine for the second time, the average was 27·7 oz., and for the last three days before his discharge the average was 46·3 oz. Now, although mistakes in the collection of urine were no doubt made by the dressers, I would point out that such mistakes probably affect the periods of greatest amount of urinary secretion most, as they occurred presumably at the time the bowels were opened daily.

To what extent the diaphoretic mixture helped this case I am unable to state, but such mixtures do not usually have much effect upon the dry skin of beriberics.

The fall in the amount of urine secreted during the second pilocarpine period is curious, but as the entry for the 20th is 11 oz. it is probable that being well able to walk at this time the return is incorrect.

I shall be deeply obliged and pleased to acknowledge any reports of the action of pilocarpine in beri-beri, and also any reports which may be made upon the chemical composition of the urine and sweat in these cases. The rise of temperature at the commencement of his relapse is interesting.

TO THE EDITOR OF THE "JOURNAL OF TROPICAL MEDICINE."

DEAR SIR,—Having been more than usually busy lately I have but just opened my Tropical Journal for March 1st, 1905. Otherwise I think I should have written before to express my surprise at a sentence which occurs in your editorial entitled, "Cancer in British Colonies."

The sentence I speak of reads as follows:—

"It is probable that sarcoma, although rare in the Tropics, is yet more commonly met with than is carcinoma, but neither the one nor the other occurs except very occasionally."

The fact that such a statement should come from the pen of the Editor of the TROPICAL MEDICINE must be taken to prove the truth of the fact stated to us who are but isolated observers in a very limited area; but what I would like to prove in this letter is that, however true the statement may be, considered in its general aspect, there are areas—at least one in which I work—which must be looked upon as exceptions to this rule.

The Tainan Mission Hospital is situated just within the Tropic of Cancer and receives patients from an area containing under one million souls. The majority of the inhabitants are Chinese, though there is a large sprinkling

of civilised Aborigines, probably of Malayan origin. I have been in charge of the hospital for only three and a half years, and as the building was a new one and the former hospital wholly unsuitable for surgical work, therefore, surgical cases at first were few, but have been gradually increasing in number. Hence, though my cases cover some three and a half years, the large majority of them were seen within the last two years, that is to say, had I seen the cases at the same rate during the whole time as I have the past two years the numbers would have been 50 per cent. larger.

I had intended to have delayed publishing till I had more material in hand, but I feel that I can append enough to prove the point of my letter.

I remain,
Yours faithfully,
JAMES L. MAXWELL,
M.D.Lond.

Tainan Mission Hospital,
South Formosa,
June 29th, 1905.

MALIGNANT DISEASE IN SOUTH FORMOSA.

By JAMES L. MAXWELL, M.D.Lond.

I PROPOSE first to give a simple list of the cases coming under my notice during the past three and a half years, and then to add a few comments on some points which seem to me worthy of note. The cases are gathered from an in-patient clinic totalling 6,000 odd, very few being taken from the out-patients who, of course, come only from a very limited area :—

Sarcomata of—			
Eye	4	2	examined microscopically
Nose	1		
Cheek	1		examined microscopically
Neck	1		,, ,,
Sterno-mastoid muscle	1		,, ,,
Maxilla	1		
Mandible	4	1	examined microscopically
Tibia	3	1	,, ,,
Meta-carpal bone (endosteal)	1	1	,, ,,
Great toe (melanotic)	1		,, ,,
Kidney	1		
Sheath of Great Pectoral muscle	1		examined microscopically
Great sciatic nerve (Neuro-sarcoma)	1		explored, but operator abandoned when position of tumour was evident
Lympho-sarcoma	2		
Total number of cases of sarcoma			23
Carcinomata of			
Scalp	2		examined microscopically
Lip	5	3	,, ,,
Tongue	4		
Cheek (perforating epithelioma)	2	1	examined microscopically
Mouth	3	1	,, ,,
Jaw	5	3	,, ,,
Palate	1		
Orbit	1		
Pharynx	4		
Œsophagus	1		
Neck	17		4 examined microscopically
Parotid gland	1		
Breast (scirrhus)	9		6 examined microscopically
Both breasts (scirrhus)	1		
Pyloric end of stomach	1		Laparotomy-gastro-jejunostomy
Pancreas	1		exploratory laparotomy
Rectum	5		3 examined microscopically
Rectum (colloid)	1		,, ,,
Anus	2	1	,, ,,
Penis	5		,, ,,
Cervix uteri	5	2	,, ,,
Scar	1		,, ,,
Total number of cases of carcinoma			77
Rodent Ulcer—			
Upper eye-lid	2		1 examined microscopically
Orbit	2		examined microscopically
Back	1		,, ,,
Total number of cases of rodent ulcer			5
Grand total of cases of malignant disease			105

A glance at the above figures will show that sarcoma so far from being commoner here than carcinoma, the former standing the latter as 1 to 3½.

A remark is called for to explain the large number of cases of cancer of neck. These are probably in many cases wrongly classified under this heading. That they were cancerous in nature there was little or no doubt; but in the large majority of cases they were probably secondary masses of glands, in nearly all they were in men who were reduced to the last stages of malignant cachexia, the primary source was not evident from cursory examination, and the patients too advanced to keep for further examination in an already overcrowded hospital.

I would add a few remarks about the regional occurrence of cancer as shown in this list.

Lip.—The proportion of cases of lip cancer strikes one as very small in a place where men and women all smoke tobacco. Chinese tobacco is not as strong as that smoked in Western lands, but is very fine cut. On the other hand, the pipes are either water-pipes or very long bamboo pipes, sometimes as long as 4 or 5 ft. Further, the pipe bowl is very small, only allowing a few whiffs before it has to be refilled. It follows from this that there is no such thing as a man walking about for perhaps an hour or more at a time with a pipe in his mouth constantly rubbing on the lips, as is quite commonly seen at home. Can it be that this rather than the tobacco itself is the predisposing cause of cancer of the lip in Western lands?

Tongue.—Even more striking is the comparative absence of cancer of the tongue. Syphilis is so dreadfully common that one sometimes wonders not what proportion of the population is attacked by the disease, but rather what proportion escapes? Yet gumma of the tongue is rare, and I have never seen a typical case of leukoplakia.

Alimentary Canal.—One of the most peculiar things is the rareness of cancer between the mouth and last few inches of the rectum. If one excludes the œsophagus, I can only record one case, viz., cancer of the pylorus. Another case of probable cancerous ulcer of the stomach I had under my care with an abscess of the lesser sac of the peritoneum, but I did not feel that my diagnosis was clear enough to include it in the list given above. At the same time, I feel that it is quite possible that a number of cases do escape diagnosis. For one thing, a large proportion of the population suffer from tropical splenomegaly, the spleen very frequently reaching beyond the umbilicus, and making the examination of other abdominal tumours very difficult. And for another, the Chinaman when attacked by abdominal complaints seems to be seized

by such a hatred of food that I believe frequently little or none is taken, and so the symptoms accompanying the ingestion of food are absent. I may be mistaken, but I am under the impression that in the hands of more skilled observers the proportion of intestinal cancers would be found to be considerably increased.

Breast.—Cancer of the breast forms a large proportion of the cases, larger without doubt than the cases in my list suggest. Four of the ten cases I have seen within the past six months; it is only as the people get accustomed to one that the patients with female diseases are willing to come into hospital, and even yet those of the better classes come in very small numbers.

Uterus.—What has been said of the breast applies with much greater force to uterine cancers. I believe they are quite common, and I could have included in my list several cases where every symptom pointed to cancer of the uterus, but where an examination could not be obtained.

Finally, there arises the very interesting question of race. At the present moment, I cannot spare the time to go into the question, and, further, the total number of cases given here is not large enough to make such an enquiry of great value; but I am myself stronglyof the opinion that the true Chinese suffer very much more from malignant disease than do the civilised Aborigines of the interior. As regards the savage races no investigation is possible owing to the warlike and murderous habits of these tribes.

"Medical News," July 25th, 1905.

The Cure of Leprosy.—J. Dyer in treating leprosy insists upon a full diet, hot baths twice daily, tonics and febrifuges, strychnine, chaulmoogra oil, long continuance of the treatment even after active signs of the disease have disappeared. Chaulmoogra oil should be given before meals, in capsules, hot milk or milk of magnesia. The oil should be given in 3 minim doses, and increased every second or third day until as much as 150 minims are given at each dose.

HARROGATE is nothing if not progressive, and the recent innovation of the Plombières treatment places this beautiful watering-place in the forefront of British spas. This is the only spa in England where this treatment can be undertaken, and invalids will appreciate the advantage of being able to make this cure on their native soil, and in charge of English doctors and nurses, in lieu of making a long and fatiguing journey to the Continent.

Persons returning from the Tropics, and suffering from digestive troubles and bowel complaints, should give this treatment a trial. As a matter of fact, it may be said to be equal, if not superior, to the treatment in Plombières, as it is assisted by the medicinal waters of Harrogate, and the invalids, braced by the pure air of the Yorkshire moors, will not require the "after-cure" so necessary after a course of treatment at most continental spas.

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THE

Journal of Tropical Medicine

SEPTEMBER 15, 1905.

YELLOW FEVER IN NEW ORLEANS.

SOMETIME between June 1st and 15th, 1905, yellow fever reached New Orleans, carried thence it is supposed by ships with cargoes of fruit from Central America. It was not until July 13th that the presence of the disease was officially known to be present. Of the seven municipal districts into which the city is divided, there is but one seriously affected, and it is the district known as the Italian quarter of the city. Outside of the Italian quarter some eight cases only were known to have occurred in the city up to August 1st.

For many years the towns on the seaboard of the Gulf of Mexico have been accustomed every summer to enforce quarantine restrictions against arrivals from Havana. This year, however, the tables are turned, and Havana finds itself in the enviable position that, whilst yellow fever rages

in most of the large ports of the Gulf, the city remains free from any epidemic outbreak. The cause of this freedom of Havana from yellow fever is due to the sanitary regime enforced by General Wood when the city first came under the control of the United States authorities in 1898, and it would be well were New Orleans and other U.S. and Mexican cities to apply the methods adopted so successfully in Cuba. The methods are simple, namely, the destruction of mosquito breeding places within and immediately around the city, and the protection of yellow fever patients by mosquito nets. New Orleans is however, allowed to remain in the insanitary state which invites infection.

The drainage of the city is surface drainage, water is stored in large tanks, and the minor details of general cleanliness are neglected. Under such conditions mosquitoes breed in myriads, and it only required the introduction of the contagion to set an epidemic agoing. This factor was imported in June, the first case appeared on July 13th, and in two weeks 283 cases of yellow fever were reported. Major Ronald Ross, F.R.S., C.B., who, with Professor Boyce, F.R.S., went to New Orleans to ascertain the measures being adopted against yellow fever, and to render assistance if need be, report that the organisation for mosquito extinction in New Orleans has been organised on most efficient and thorough lines. The city is divided into districts, each with its responsible staff, public lectures are delivered on the means by which yellow fever is spread and on the steps necessary for each householder to take to ensure the eradication of mosquito larvæ. The lesson learned in Havana is being taught afresh in New Orleans, and we are prepared to hear that the results will be equally brilliant.

Books, Periodicals, &c.—In their booklet just received, Wm. Dawson and Sons, Ltd., Cannon House, Bream's Buildings, London, announce that they despatch by first mails any publication in the world ordered through them. They give a list of annual subscriptions to English and foreign newspapers, magazines, medical and scientific journals, &c. Medical men residing abroad would do well to note the firm's address.

LONDON SCHOOL OF TROPICAL MEDICINE.

Opening of Winter Session.

Inaugural Address by

Dr. G. H. F. Nuttall, F.R.S.

Student's Dinner.

The Autumn session of the London School of Tropical Medicine opens on Monday, October 2nd, 1905. During the past year new laboratories have been opened at the school and two new departments, one of Parasitology and one of Helminthology, have been established. The equipment of the school continually advances, but the increasing demands of tropical pathological teaching are so rapid and numerous that it is difficult to keep pace with even essential, let alone anticipated, requirements. The Annual Inaugural Address will be delivered by Dr. G. H. F. Nuttall, F.R.S., of Cambridge, on Wednesday, October 11th, at 3 p.m., in the lecture theatre of the school. On the same evening a dinner of past and present students will be held, under the presidency of Sir Ralph Moor, K.C.M.G. This is the first students' dinner ever held in connection with the school, and therefore the occasion should prove interesting. Of the many old students of the school, now numbering well over 500, the majority are stationed in the Tropics, and consequently the gathering at the dinner can but represent a fraction of those who might be, and who no doubt would wish to be, present. Medical practitioners in warm climates have so much in common to speak of; they have had to an extent and in a manner unknown to medical men in Britain to face so many difficult situations and "tight corners" in the practice of their profession, that the very fact of having practised in a tropical climate establishes a bond and *camaraderie* between medical men which promotes good fellowship and furthers acquaintance.

The dinner will be welcomed by all those who can possibly avail themselves of the opportunity of meeting their brother practitioners from countries which, although lying far apart, present in their environment, in their diseases, and in the daily routine of professional life, so much in common.

Tickets, 10s. each (guests are allowed), can be obtained on application to the Secretary, London School of Tropical Medicine, or to the Secretary, Seamen's Hospital, Greenwich, S.E.

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.

Cambridge, August, 1905.

The following candidates, having satisfied the undersigned examiners, are entitled to receive the Diploma: Percy William Bassett-Smith, Harry Andrew Foy, Wyndham Malan Grattan Guinness, John Taylor Connell Johnson, Rustamjee Manakjee Kalapesi, Daniel Mackinnon, Arthur Robartes Wellington.

George H. F. Nuttall.
Ronald Ross.
George C. Low.
} Examiners.

August 19th, 1905.

Six of the seven successful candidates had taken out a course of instruction at the London School of Tropical Medicine.

Review.

REPORT OF THE HEALTH OFFICER FOR THE COLONY OF NATAL FOR THE YEAR ENDED DECEMBER -- 31ST, 1904.

ERNEST HILL, M.R.C.S., L.R.C.P., D.P.H., Health Officer of the Colony of Natal, has drawn up the third annual report of the Department of Public Health for the year 1904.

The census taken during 1903 showed the European population to be 101,183, exclusive of troops. The births numbered 3,156, deaths 1,102, being respectively 10·89 and 31·19 per thousand living per annum. The general death-rate among Indian immigrants exceeds that of Europeans by no less than 8 per 1,000.

Plague, during the year 1903, attacked some 208 persons, but during 1904 only 18 cases (13 deaths) were recorded; the majority of the cases occurred in Durban, where the disease appeared in the month of April.

Small-pox cases, which in 1903 numbered 286, during 1904 numbered 1,238. The effect of the outbreak has been to draw attention to vaccination. Mr. Hill states that the natives fully appreciate the benefits of vaccination against small-pox, but, owing to the apathy of the local authorities as well as of the British employers of labour and to the exigencies of war, vaccination had been largely neglected.

Enteric fever cases amongst Europeans during 1903 numbered 919, of whom 84 died; but during 1904 the numbers were reduced to 516, of whom 58 died. Reports from all parts of South Africa indicate a general reduction of enteric fever, but to what the reduction is due is not known.

Dysentery and *Diarrhœa* proved less of a scourge during 1904 than 1903; the same is to be said of *Scurvy*.

During the past year the infectious diseases notified amongst Europeans were: *Diphtheria* and *Membranous croup*, 65 cases; *Scarlatina*, 70 cases; *Erysipelas*, 41 cases; *Malaria*, 76; *Small-pox*, 99; *Plague*, 4. *Beri-beri* was met with at the port of Durban amongst the Chinese immigrants for the Transvaal, but no cases of beri-beri occurred amongst the people of Natal.

Clayton's fumigating apparatus is highly spoken of and Mr. Hill considers that a vessel leaving harbour, which bears a certificate of having been fumigated by the Clayton process should be, and probably would be, relieved from quarantine restrictions when entering other ports.

Correspondence.

TO THE EDITOR OF THE "JOURNAL OF TROPICAL MEDICINE."

SIR,—In p. 270 of your issue of September 1st, just received, Major R. H. Elliot, of Madras, has, I regret to state, missed the real contention as to the points I particularly drew attention to in your Journal of July 1st, 1905. At the same time he has given preponderance to others, the construction of which, he has either consciously or unconsciously, credited me with the desire to appropriate priority or originality, in the discovery of.

Perhaps, if Major Elliot would read my remarks on *Cataracts and Secondary Cataracts, &c.*, with care and thought, he would see, that I directed attention to certain pages in my brochure on "the *Method of Operating for Cataract*," published in 1894, where I have dealt with those points I mentioned, more clearly and fully, and have also given praise to such pioneers of ophthalmic surgery as Von Graefe and others. I sincerely trust, if Major Elliot is desirous of understanding more clearly what I refer to, he will send for a copy of my book to Messrs. J. and A. Churchill, the publishers.

I regret that, instead of referring to the points I drew attention to, he has preferred to plead his (*A*), ignorance of my book, which had previously dealt with the real points at issue, namely; (a) the advantages of using Bowman's simple spring speculum by adjustment to the inner canthus of the eye in cataract extractions, which keeps off pressure from the eyeball (*vide* pp. 12-13 of my brochure); (b) the value of irrigating the anterior chamber of the eye, which had never been mentioned by any other operator that I am aware of (*vide* p. 23 of my brochure). (*B*), And drawn Von Graefe and Drake-Brockman most calmly into a sulphurous fray; with the attempt also of drawing them and myself into a controversy over a subject which there can be no contention about, since my contentions refer to the above points *a* and *b*, and not what Major Elliot has so skilfully conjured up for your readers. The astute campaigner is again abroad, and I am not anxious to have any baggage annexed and carried away to that province formerly known by the name of "Benighted," but is certainly more fully entitled to the term, "refinely enlightened," hereafter, from the North even to Tuticorin.

The plea of ignorance while desirous of claiming priority and originality for a discovery or method of the nature mentioned above, when even using an "old-fashioned type of speculum" (Bowman's, I presume, or a modification of the same), which Major Elliot has thought wise to disclose in a very delicate manner, is the most original way of getting over the point at issue, and I certainly do give Major Elliot the priority, if he wishes, for this method.

As regards the point (b), in the value of irrigating the anterior chamber of the eye by the method described by me in my brochure, my remarks were certainly not directed to Major Elliot, as will be seen from what I said in p. 196 of your issue of July 1st, when I spoke of "another operator of the eye." But, as Major Elliot has deemed fit to take up the same, and to say that my method with 1 in 10,000 solution of perchloride of Hg: is "opposed to the most elementary principles of physiology," I can only say that if I have erred according to his idea of the subject, certainly I have done so on the right side, as men often do in all walks and professions in life; at the same time, the extent of 90·6 per cent. of successes of my cases of cataract I have operated on (*vide* p. 35 of my brochure and compare with the statistics in p. 36), compare most favourably with the results of any ophthalmic surgeons of India, and it is thus that I have made not only the *best use* of my opportunities, but won the esteem and gratitude of the people of Bijnor and Benares (where I was civil surgeon of the Bijnor Hospitals and of the Prince of Wales's Hospital in Benares), besides receiving the thanks of the Government of the North-Western Provinces and Oudh for the praiseworthy manner in which my duties were discharged. These are more to me, than adhering to a theory of very little value in practical work, which, by a particular technique in operating skilfully, can be easily overcome. We can at times adhere to theory too much and sacrifice utility, which in my opinion is very unwise, since Listerian principles of antiseptic surgery have opened out the gates to tactical operators in the field in a manner truly remarkable, and no portion of the human body can be said to be sacred to the intrusion of the surgeon's knife; and that surgeon is the most skilful who, ere he lift his scalpel, mentally takes into consideration the *pros* and *cons* of his case.

I am prepared to prove to Major Elliot or any others with regard to the above points which I have claimed priority in introducing—provided my expenses to and from, and while in India are paid—that my patients whom I have operated on have benefited greatly by the methods named. I have no doubt that hundreds of my cases, whose names and addresses I have in my books, are still living, and could offer themselves as living testimony of those methods which I employed, and the records of which I have in my possession. If Elliot would desire to see me perform the same operation with similar methods and with the same measure of success, I will be glad to accept a challenge from him under the conditions mentioned. I feel I cannot do more to satisfy him as to the claims my work has upon his consideration, and there can be no other testimony of my having made the *most* and the *best* use of my opportunities than what I have already laid before him and the public. My brochure was published in 1894, at a time when the question of iridectomy in cataract operations was a point of controversy among some ophthalmic operators. Surely he does not blame me for publishing my views before the medical profession with the experience I had had? I consider that it would have been opposed to all medical ethics to remain silent when one could aid in a discussion and enable a consensus of opinion being formed on this point. Had Major Elliot been so interested in ophthalmic surgery in those days as I was, and still am, he might have possibly read my brochure, and even listened to a portion of the same that I laid before the Indian Medical Congress at Calcutta. I feel, however, that he might have done so, at any rate, after I had drawn attention to those pages in it, when I contributed my remarks on cataract, &c., in your journal, when he then would have certainly been the better able to judge of the righteousness of my contention, instead of consigning me and my work to an unknown region of thought.

In my brochure I have clearly pointed out, that in only 2½ per cent. cases of cataract operated upon with the greatest success was this particular form of *impairment of vision* found, which could be removed. My experience of these cases was limited to the North-Western Provinces and Oudh, for in India, which is a large country, apparently "racial influence" and "diet" have something to do with the various forms of cataract noticed. This being the case, surely Major Elliot is willing to admit that Major Maynard, whose field of operations was limited to Bengal, and who, as I was told, had done only about 100 cataract operations in the Bengal circle, could not possibly have been in as fair a position as I, to judge of this particular impairment of vision, since I was the observer, and my successes were 90·6 per cent., which would not have been the case in immature cataracts; and having done 1,000 operations for cataract of various kinds by eclectic methods, I had surely learnt to diagnose a mature from an immature one? The conclusions, which Maynard drew were, in my opinion, not only hasty, but far from what is permissible in the rules of debating or discussion; and, moreover, my reply as the introducer of the discussion was omitted from the *Transactions* of the Indian Medical Congress, when printed in the form of a volume, which I received *months after*.

Maynard's procedure and answer reminded me very much of the school-board lad who was asked by the examiner if he knew what "transparent" meant? "Yes," said the lad, "something you can see through." "Give an example?" "The key hole," was his reply. This illustrates that there is much that can be seen through which is both transparent and yet not transparent.

Yours truly,
G. H. FINK, Major,
I.M.S., M.R.C.S.(Eng.), L.S.A.(Lond.).

12, *Fairfax Road*,
Bedford Park, W.,
September 10th, 1905.

TO THE EDITOR OF THE "JOURNAL OF TROPICAL MEDICINE."

SIR,—My attention has been called to your report of the speeches at the dinner at the Hotel Cecil on May 10th, on behalf of the funds of the London School of Tropical Medicine. Therein I am reported as having said that the first sleeping sickness commission to Uganda "was sent out under the auspices of the School." It has been pointed out to me that the word "auspices" is calculated to mislead. It may be well, therefore, to state that the commission was sent out by the Royal Society, and that it was under the *auspices* of the Foreign Office. The share of the London School of Tropical Medicine in the matter was to supply two of the three commissioners constituting the expedition, namely, Dr. George C. Low, Cragg's scholar at the time, and therefore to that extent financed by the School, and Dr. Aldo Castellani.

Yours truly,
August 29th, 1905. PATRICK MANSON.

[We are sorry that in our report of the speech mentioned by Sir Patrick Manson we should have wrongly reported his statements. We insert his letter and correction with pleasure. Those who were present at the dinner must be well aware that Sir Patrick in his speech made the statement as he now writes, and not as we reported.—J.C.]

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

The Ability of the Larvæ and Pupæ of the Stegmomyia Fasciata to withstand Desiccation.

J. D. Berry, M.D., states from experiments conducted at Laredo, Texas, in 1904, and published in the Public Health, U.S.A. Reports for June 16th, 1905, that the larvæ of stegmomyia do not burrow, but merely settle on the surface of the mud as the water is evaporated; the larvæ can stand drying for hours, but not for days and weeks. The S. fasciata does not occur in puddles, but the pupæ of this mosquito can be successfully hatched out of water, and the larvæ will live for a considerable time under these conditions. The pupæ emptied on the ground on cloudy days or late in the afternoon will probably hatch, but the mere emptying of a vessel containing stegomyia pupæ does necessarily kill the pupæ.

"Presse Médicale," April 15, 1905.

Cutaneous Ankylostomiasis. By W. Dubreuille.

Dubreuille has collected the evidence from all available sources showing that "ground itch" is caused by the larvæ of ankylostoma occurring in the soil.

Notices to Correspondents.

1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the JOURNAL OF TROPICAL MEDICINE should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communications.

PAPERS BY FREDERICK CREIGHTON WELLMAN, M.D.

Bailundo, Angola Portuguese, West Africa.

I.

Preliminary Note on a Trypanosome Found in the Blood of an African Dove (*Treron calva*).

As the writer has pointed out on other occasions, trypanosomes of both man and animals (in this high, cool tableland) have been difficult to find, although common enough in other parts of tropical Africa lying on lower levels where conditions for their spread are doubtless more favourable. I have continued, however, to examine with this parasite in mind the blood and tissues of whatever animals I could obtain, and some

Trypanosoma sp. from Blood of Treron Calva.

days ago, while examining the blood and bone marrow of three birds—the "wild dove" (*Treron calva*), the "banana eater" (*Corythaix paulina*), and the "ox bird" (*Busphaga Africana*)—as well as some specimens of a common lizard (*Aconteas meleagris*), I found a trypanosome in the heart blood of the first-named bird. And although I hope to follow up the study of this and other bird trypanosomes of this region, I publish in the meantime this note, with which I submit a drawing of the parasite, some measurements, and one or two remarks concerning special features which it presents.

Measurements.

Length	(about)	28μ
Greatest width		9μ
Distance of centrosome from end		4μ
Length of free flagellum	(about)	8μ
Longest diameter of nucleus ...		6μ

Remarks.

Faint longitudinal striæ or myonema lines can be made out in the protoplasm as well as very fine granules. The nucleus extends about two-thirds across the body and seems to almost completely fill the space in which it lies. The flagellum and undulating membrane are wavy in very regular curves. The free flagellum is comparatively short. I do not attempt to compare it with other similar trypanosomes, as I have not as yet had opportunity to attempt cultivation or inoculation experiments.

July 25th, 1905.

II.

Ainhum and Leprosy: a Critical Note.

The writer has several times seen the suggestion that ainhum may be a manifestation of leprosy. In an article on the question in a recent number of the Journal which I have unfortunately lost, the subject is entered into with a great deal of definiteness. Cases are given and the hypothesis discussed at some length. The matter is one of interest. I have accordingly called up the few cases of ainhum I know of in this district (three men) and somewhat carefully examined them with this thought in mind. All the evidence I can collect would seem to militate direct against the theory. In none of the three instances is there a single symptom or indication that suggests leprosy. Whatever may ultimately prove to be the truth as to the ætiology of ainhum, the following observations in my own particular cases would seem to fairly demand a different interpretation from that attached to similar observations made elsewhere.

(1) In none of the cases is there a leprous lesion demonstrable.

(2) In none of the cases is there present the characteristic facies familiar to those who are acquainted with negro leprosy, nor any of the other early clinical symptoms of leprosy.

(3) In none of the three cases is there a family history of leprosy. (I have seen the parents of two of the men and the father and grandfather of the third.)

(4) Only one of the cases comes from a district in which leprosy is known to exist.

(5) In none of the cases can *B. lepræ* be demonstrated in the nasal discharge by Ziel Neelsen's method, and in one case where I had amputated the offending toe no bacilli could be seen in a section of the integument from the constricted portion stained after the same method. The histological appearances, too, are different from those of leprosy, showing only the familiar fibrosis and atrophy common to all cicatricial tissue.

Of course three negative cases are not sufficient to establish any important decision of this kind, and I hope that someone with more available material will examine a series of cases and endeavour to settle the point at issue. Meanwhile, unless ainhum be a much earlier symptom of leprosy than the character of the lesion would indicate, I should be decidedly inclined to hold their suggested relation *sub judice* until further positive evidence appears.

Bihé, Angola, W. Africa.

III.

Case of Severe Epilepsy, showing Extensive Burns due to Repeated Falling into the Fire.

Case. *No.* M. 283.

Name. Sachikundi.

Age. 30 years.

Sex. Male.

Race. Bantu.

History.—Never had fits until 1899. In that year they came on, the attacks occurring more frequently in the beginning of the disease than later in its course. Has fallen into the fire a number of times during seizures. Two years ago he was put out of his village, because he was so badly burned, and lived in the bush for some time. The sores on this occasion did not all heal for a long period. Natives state that he formerly

Photo by Rev. W. T. Currie.

Photograph of Case No. M. 283, showing extensive scars on Hands, Forearm, Shoulder and Face.

possessed considerable capital in the form of slaves, ivory, &c., having been an energetic hunter and trader, noted for his strength and prowess; but since his misfortune he has been an object of charity. He has not had fits for some time, and has been allowed to return to his village.

Condition.—A tall, well-made man in fairly good condition. Claims to be entirely blind, although it is probable he can see a little light, as the retina would not necessarily be injured by the superficial cicatrization. There are a number of scars from burns, &c., on different parts of the body. The most extensive are those covering the right shoulder, forearm, hands and face. The eyes and mouth are drawn open by contraction of the scar tissue. Saliva continually dribbles from the mouth. Mind clear, and is as intelligent as the average native. He goes about alone, feeling his way with a stick.

PREVALENCE OF EPILEPSY.

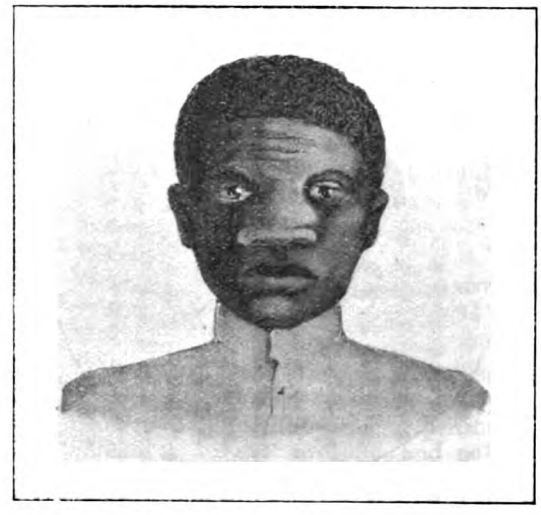
Epilepsy is a common affection in this country. Nearly every small village has its one or two epileptics. Considered by the natives a contagious disease. Healthy natives will not sleep or eat with an epileptic. I have seen many cases of burns, several of them of a fatal character, caused by falling into the fire during epileptic seizures. The native custom of sitting about small fires is responsible for most of these cases. The superstitious fear with which the blacks regard epileptics, keeping them back from helping or touching one during a seizure, makes possible the large number of shocking accidents of which the case under discussion is an example. Convulsions due to ascariasis and other causes apart from epilepsy are as a rule confounded by the natives with the latter disease.

IV.

GOUNDOU IN SOUTHERN ANGOLA.

I enclose a rough sketch of the head of a Bantu boy with Goundou. I saw him while on a shooting expedition, no camera being within reach, hence this imperfect drawing.

He is an active, intelligent boy of about 16 years of age, and was sent by a native chief in response to my demand for an expert tracker to follow up some eland



Bantu Boy with Goundou.

spoor in hard, rocky ground. Says he has had the tumours from childhood. Had many headaches when a small boy, but never any discharge from the nostrils or other inconvenience arising from the presence of the growths. They do not interfere with his breathing, as he is a good runner. Sleeps with his mouth closed. Says he has never had yaws.

This is the only case of the kind I have seen in the course of a pretty large experience among the Angola Bantus.

ON THE BEHAVIOUR OF CERTAIN BODIES WHICH CLOSELY COMMINGLE WITH AND RESEMBLE LEUCOCYTES IN THE EARLIEST STAGES OF CANCER FORMATION IN THE HUMAN BODY.

By MAJOR G. H. FINK,, I.M.S., M.R.C.S.(Eng.), L.S.A.(Lond.)

Late Civil Surgeon Bijun District, and Prince of Wales's Hospital, Benam.

HAVING read a paper on "Cancer and Precancerous Changes, their Origin and Treatment," in the Pathology Section of the British Medical Association at Leicester on the 28th of July last, and also having just read the

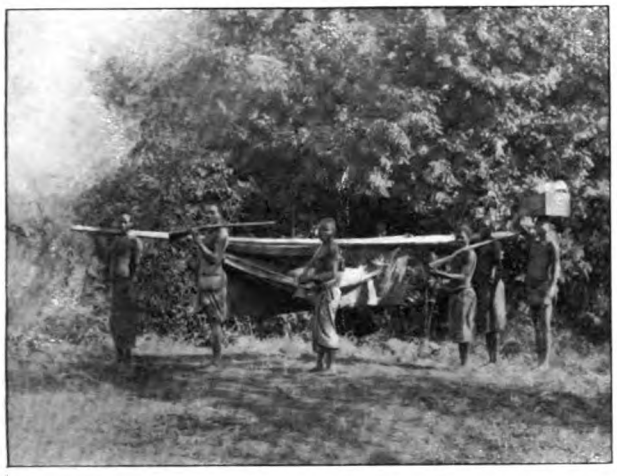


FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

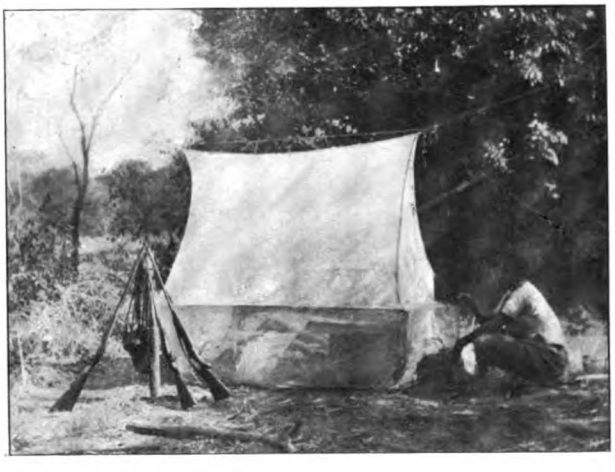


FIG. 5.

To illustrate Article by G. A. PARK ROSS, M.B., D.P.H., on "Hygiene on Shooting Trips," in Journal of August 1st, 1905.
For description of photographs see page 287, October 2nd, 1905.

later investigations of Professors Farmer, Moore and Walker, in pp. 314-315 of the *British Medical Journal* of August 12th, which has just come to hand, I feel it would be of interest at this time to point out the resemblance of certain bodies, already mentioned by me at Leicester, to leucocytes and their behaviour in malignant growths. I have referred to the subject in my paper above quoted as a *cyto-parasitico bacterial* invasion of the human body, and showed the part played by the cell, the parasite, and the bacteria, in the earliest and the later stages when suppuration occurs and the bacteria are found.

In referring to the term *later* in connection with Professors Farmer, Moore and Walker's investigations, I have done so because, in their earlier researches reported in pp. 1,411-1,412 of the *Lancet* of the 27th of May last, under the title of "On the Resemblance existing between the 'Plimmer's Bodies' of Malignant Growths and certain Normal Reproductive Constituents of Reproductive Cells of Animals," these gentlemen made no reference to the subject in the same manner as they have now brought forward in the pages of the *British Medical Journal* as above referred to, and it would be interesting to compare the behaviour of the bodies I have mentioned in my paper which I hope will be published *in extenso* by the *British Medical Journal*. At this juncture, I trust that I might be permitted to draw attention to the matter briefly through your columns, although the paper is claimed by the *British Medical Journal*, who have alluded to it in abstract form only in page 281 of the issue of August 5th, 1905.

At the outset of my paper, I based my analogy of cancer origin so far back as 1903 on the great discovery of Woronin and Eidam respectively, with reference to nodules in plants and tumours in animal tissues in their connection with *myxomycetes* and *myxamœbæ* which entered certain cells and became inextricably commingled and fused together in such a manner as to cause great difficulty in differentiating the one from the other in the processes involved.

I then pointed out the importance of considering Paget's, Erichsen's and Plimmer's definitions of cancer in conjunction with the statements above given, laying particular stress upon that portion of Erichsen's where he states, "Some chemical substance of an irritating character is poured out which causes an infiltration with small round cells which have the appearance of migrating white corpuscles, but in part probably arise from the multiplication of the cells of connective tissue."

The above statements, I maintain, have helped to focus the causation of cancer formation and to give the right interpretation to the processes involved in the *anaabolic* and *cutabolic* stages (if I might borrow the terms), whilst the analogy of the processes involved in malarial transmission by the *accidental* and the most *constant* source, where an endocorpusclar parasite is the cause of malarial fever, has helped to also bring to light that by a somewhat similar method cancer is carried through an intercellular and intracellular parasite, which fuses itself with the embryonic cells of the mucoida gelatinous type, and which in appearance closely resembles the leucocytes and lymphoid corpuscles, and are thereby conveyed to distant parts (into cystic and benign tumours and dropsical swellings) where a certain *tyrotoxicon* chemical substance of an irritating character is also borne, and which increases side by side with the increase of the reproductive cell elements and the parasite, which go hand in hand in the process.

I do not consider it necessary to say more at present, but hope that my paper which I read at Leicester, and the photomicrographs, will soon be published in full, and thus give those who are interested in the subject of cancer formation an opportunity of adding their experience.

ANGLO-PORTUGUESE BOUNDARY COMMISSION, RUIA RIVER, JULY 7TH, 1905.

Hygiene on Shooting Trips.

[In the Journal of August 1st, 1905, we published an article on "Hygiene on Shooting Trips," by Dr. Ross. We are now favoured with additional photographs illustrative of the text.—Ed. J. T. M.]

G. A. Park Ross, M.B., D.P.H., writes :—

Last mail I sent you an article on "Hygiene on Shooting Trips," and this week I enclose a set of photographs showing my *ménage* in working order.

(1) Shows my loads carried by three boys, *e.g.*, two on the machila and one carrying food, also my three gun boys.

(2) shows my boys laying down grass for the floor of the tent.

(3) The machila cover as a carpet. Blankets in position, and box for table.

(4) The net over all and a boy holding the "trap" open.

(5) The "white chief" feeding inside, food being passed through the trap. Another boy at left-hand side is working the filter.

I took these while demonstrating the outfit to a sportsman I met. He was very taken with it.

There is very little medical work to be got here, and for the last two months the country we have been in was disturbed by a Portuguese war, with the results that all natives bolted on sight except a few who had an occasional shot at our carriers.

The Teeth of the Natives.

I was interested in some articles on the preservation of teeth in natives, specially by remarks by a Dr. Howard writing from Dar-es-salaam. He argued that the chief agent in preventing decay was constant rubbing with a piece of frayed cane or a root All the Lake boys keep their teeth in this way, and they are connected with the coast tribes, bnt among those of high veldt origin the method used is merely to rinse the mouth with water several times a day. I examined the teeth of a batch of 200 Angoni carriers to-day and also of 100 Mashonas. The former tribe is of Zulu origin and inhabits the high veldt between Lake Nyassa and Fort Jameson. Their food is entirely vegetable, consisting of rice, mealies and ufa (mealies and Kaffir corn mixed).

The Mashonas are also vegetarians and live largely on this ufa.

No man examined had worked in mines (been subjected to a meat diet), or had evidences of syphilis. I classed them as under :—

Good.—Men in whom all teeth were present and in whom there was no evidence of disease of the teeth, caries, pyorrhœa, &c.

Indifferent.—Men in whom not more than three teeth were absent, or if present affected with caries however slight, and who showed no signs of pyorrhœa.

Bad.—Men in whom neither of the above conditions obtained.

	Good.	Indifferent.	Bad.
In 200 Angoni ...	74·5%	... 16%	... 9·5%
In 100 Mashonas...	71%	... 21%	... 8%
% in Total of 300	73·3%	... 17·6%	... 9%

The ages of the carriers varied between 16 and 50. Those classed as indifferent would in every case be considered to constitute "good" teeth in a European. I leave you to make your own deductions. I have not got the number of the JOURNAL with me which contains the letters.

THE IMPORTANCE OF THE HYALOID MEMBRANE IN MATURE CATARACTS IN INDIA.

By MAJOR G. H. FINK, I.M.S., M.R.C.S.(Eng.), L.S.A.(Lond.)

IN continuation of my remarks which I contributed in p. 196 of THE JOURNAL OF TROPICAL MEDICINE for July 1st of the current year, on secondary cataracts and membranous opacities, I would desire to show the importance of the hyaloid membrane in such cases.

It is the more necessary to do so since I read a paper "On the Treatment of certain cases of Impairments of Vision after successfully operating for Cataract by lacerating the Hyaloid Membrane" before the Ophthalmological Section of the First Indian Medical Congress held at St. Xavier's College, Calcutta, in December, 1894, when an unfavourable criticism was published in p. 175 of the *Transactions* of that meeting; but my reply to Major Maynard, I.M.S., was omitted, which reply, as the opener of the discussion by the reading of that paper, showed the importance of the hyaloid membrane in the operations successfully performed for *mature* cataracts. I pointed out in that paper that in 2½ per cent. of cataract cases *successfully* operated upon, there was to be noticed a certain form of impairment of vision which could only be ascertained and treated with success immediately after extraction of the cataract had been done, by testing the patient's vision by holding up your fingers before his eyes to count. In so doing, the patient who had been successfully operated upon (and there seemed no reason why he should not see) replied, that he could not see. In such cases if you examined the eye carefully, although the pupil presented to the naked eye a perfectly black appearance, yet, on using a magnifying glass placed before the eye or direct examination with the ophthalmoscope, there was to be observed a cobweb-like structure in the *fossa patellaris*. If now the cystotome be applied gently to the centre of this cobweb-like membrane, and the same lacerated, the immediate result of this second operation at one sitting, gives vision, for the patient now says, he is able to see, which he did not before. In such cases, I also have observed a slight escape of vitreous, which, in my opinion and that of several ophthalmic surgeons, is of very small consequence under antiseptics. But it is a most remarkable fact, that in these 2½ per cent. cases, there is immediate vision, and the escape of vitreous is remarkably small. Major Maynard considered that I had been operating on immature cataracts, and thus criticised my paper. It was impossible for me, with the results of my operations for cataract extraction where I had 90·6 per cent. successes, as reported in my *brochure* on the "Methods of Operating for Cataract," pp. 34 and 35, to have selected immature cases for operating, since my operations were by eclectic methods, and I would not have had such results as these in over 1,000 cataracts I had operated upon. I have had as many as 200 patients sometimes of a morning, while on my tours in the Bijnor District, in the North-West Provinces and Oudh, waiting to be operated upon; and have selected about 30 cases fit for operation, and these were *mature* and *none immature*. It would have been impossible to get any such results in cases that were immature, and this particular form of impairment of vision after a successful operation for cataract has been undertaken, is only to be found in 2½ per cent. *mature* cataracts that have been extracted *secundem artem*, and *never* in immature cases. The results would be disastrous to your patient if attempted in cases that are immature, and the escape of vitreous on laceration of the hyaloid membrane would be so excessive, that there would be every chance of the patient losing his vision, with grave danger of panophthalmitis setting in.

The point to be noted is, that when I wrote my *brochure*, and read my paper before the first Indian Medical Congress at Calcutta, the fact that the posterior capsule of the lens was a membrane quite distinct from the hyaloid membrane which encircled the vitreous, and was in close apposition to the posterior capsule of the lens, was not sufficiently well recognised by a great many ophthalmic surgeons. I had satisfied myself, after consulting some of the highest authorities in Europe, that the posterior capsule and the hyaloid membrane, were not identically one and the same, although, owing to their very *close apposition* some were inclined to consider that they were one and the same.

In certain parts of India, where *racial influence* and *diet* enter into the subject of cataract formation, there is a form of hard cataract produced, which it is necessary to diagnose correctly and to consider the points I have given, in my *brochure* pp. 18-26. The indications for performing iridectomy, and for the extraction of the lens whole in its capsule; or, by the laceration of the anterior capsule only; as well as the extent of the corneal incision in flap extraction, are most important. It stands to reason, that an inorganian cataract would require only a very small incision, with no iridectomy, and a membranous cataract where the lens has been spontaneously absorbed, scarcely an incision; but only the usual use of the iridectomy knife or Jager's triangular knife to the depth of one-eighth of an inch, through which a fine

pair of iris forceps is inserted carefully under antiseptics to the surface of the membrane, which is now easily drawn away. These later forms of cataract are easily diagnosed with a little practice, and it is very important for your patient to be able to do so, since the operation is comparatively trifling compared with a hard senile cataract which is quite mature and needs greater care and more skilful handling, both before and after, extraction of the lens, with, or without iridectomy. I have found in India, that some patients will consult the surgeon in time for an easy extraction to be made, *e.g.*, when they notice that vision, in one or both eyes, is completely lost; and this is usually to be found in the more intelligent classes who read and write, and do fine work, such as wood carving, weaving, &c. But among the less intelligent, they defer it very often too long, when the cataract is, what one would term, *hypermature*, and has, to use a term, *over-ripened;* and in this process it has become swollen and exerted backward pressure to that degree at the point of the *fossa patellaris*, that a stage has arrived that needs to be considered carefully, *i.e.*, the cataract is fully matured, and then overmatured as it were and brought about a separation of the posterior capsule from the hyaloid membrane; but the backward pressure in the latter has caused a certain degree of membranous opacity, which, though you might successfully extract such a cataract whole in its capsule with the greatest ease and skill leaving a perfectly black pupil, still, the patient on being asked to count fingers held up before the eyes, says, he cannot see. Why? Because the hyaloid membrane which is intact and holds the vitreous, has taken on a slight membranous opacity in the centre of the *fossa patellaris* through which parallel rays of light cannot pass. The majority of patients operated upon successfully for cataract, by extraction of the lens, can see immediately after the operation to be able to count fingers held up before the eyes; but, in the 2½ per cent. cases mentioned, with this particular impairment of vision, the patients are unable to do so; and by slight laceration of the hyaloid membrane, as I have found, they are able to see *immediately*. It is my opinion that many such cases have been left to their fate when it is supposed that nothing could be done, and then deep nervous mischief is either considered to be the cause of loss of vision, or, in some cases, a secondary operation is undertaken weeks or months after when flocculi of lymph appear from the surface of the hyaloid membrane where pressure has been exerted by a hypermature lens. Such delay, in my opinion, is a danger.

In the case of a myopic eye with a full and elongated eyeball, there is grave danger of deep nervous mischief setting in if the case be left to its fate, as can be easily understood; but in a hypermetropic eye, the dangers are not so great with a flat eyeball. It is fortunate, however, that, as age advances, the eyeball shrinks; while the vitreous within the hyaloid membrane is not so great in quantity, hence the operation in these cases of hypermature cataract in advanced age (60 and upwards), can be undertaken with scarcely any risk whatever if antiseptics be employed, and the operation be done with care and skill, and at one sitting. If one considers the delicate structure of the eye, and the continual exercise of that organ in the act of accommodation; and how the lens bulges out, or rather undergoes a change of convexity almost every moment of our lives, we can understand, that after the age when presbyopia sets in (45 years) and a + 1D is used, as presbyopia advances there are in India, among the less intelligent classes, a tendency to resort to *bazaar-made* lenses until sight is absolutely lost. This tendency therefore of allowing things to go on, until a hypermature cataract forms, creates through constant accommodation at the period before hypermaturity, a great deal of pressure which is applied backward and in the region of the *fossa patellaris*, which sets up this particular impairment of vision, which though not a secondary cataract in the usual acceptation of the term, still, is a form of *secondary change* through a *primary cataract*, which I feel is deserving of the appellation *hyaloid cataract* (secondary), especially as the hyaloid membrane is involved, and not the posterior capsule of the lens; the former is quite a separate structure from the latter, and as age advances, it becomes more clearly differentiated as a structure which contains the vitreous humour of the eye, and in close apposition to the lens, there being the posterior capsule as a partition between. If we now regard the pressure of the vitreous from behind, and the lens in front during accommodation and muscular effort exerted upon the eyeball, we can see what necessity there is for a fine and elastic, yet strong membrane, to enclose both vitreous humour in the one case, and lens on the other, between which, there is, as it were, a ball and socket joint and an appreciable amount of moisture, which, as age advances, decreases considerably, hence, pressure effects are witnessed.

SOME CLINICAL NOTES ON THE ETIOLOGY OF SPRUE.

BY

DAVID J. GALLOWAY, M.D., F.R.C.P.Edin.

Singapore.

IT is a trite saying that our success in the treatment of a disease is in inverse ratio to the number of remedies advocated. The same formula might in many instances be aptly applied to the etiology also, inasmuch as our knowledge of the causation of a disease is in inverse ratio to the number of factors invoked. It is notable that, as factors in the etiology of Sprue, every possible cause, seismic, atmospheric, dietetic, physiological—even pregnancy, have been pressed into the service, and it might be profitable to discuss a few of those in the light of clinical experience.

Prolonged residence in a warm, moist climate has been cited as a cause, and in natives of Java, Sumatra, the Philippines, Cochin China and the Straits Settlements, both postulates are fulfilled. But the disease is not at all common among them. In a series of 80 cases they formed but 37 per cent. of the whole. Among Europeans in these countries the residence need not of necessity be a long one. Thus, in my records, two developed the disease in ten months, one in fourteen months, and another within two years.

It is undeniable that most if not all the cases which

find their way into the hands of practitioners in Europe have a history of having been in touch with, if not actually resident in the Tropics for many years, but it is also undeniable that these are cases of the fully developed disease which may have been in progress for nearly the whole term of their residence abroad, and which ought to have been recognised and treated years before. Instances of the disease are recorded from Ceylon, India, S. China and Hong Kong, where the conditions of climate required hold good for only some months in the year. Cases also come from N. China and Japan, where the climatic conditions postulated are non-existent. It is difficult to assume that a disease which is found to be indigenous from the tenth degree S. to the thirtieth degree N. latitude, and from the 70th to the 140th degree east longitude, is due to the agency of climate alone.

Pregnancy and miscarriage have been cited as causes, but their etiological value is on a par with the fevers, malarial or other, or any other state of physical stress determining an exacerbation in an already existing disease.

Repeated catarrhs of the stomach is merely the erroneous interpretation of the symptoms in the early stages of gastric sprue.

The question of diet is an extensive one upon which much argument has been expended, but its consideration is immensely simplified by the heterogeneity of the races in which sprue occurs. So far as my records go, Europeans, Eurasians, natives of India and Ceylon, Malays, Chinese, Japanese, Arabs, Filipinos, all seem to be liable to the disease, though not in a uniform degree. In Asiatics the racial factor in the consideration of diet is secondary to the religious, the ethnical to the ethical, each faith having its own rules as to food and its preparation, and probably not any two of the preceding races have diet alike. However all-important diet may be in the aggravation of sprue, or in its treatment, it must, as an etiological factor, be excluded on racial grounds alone.

Much has been ascribed to the *rôle* played by the liver in sprue. Whatever that *rôle* may be, it is not secondary to any changes in the liver, as, beyond participating in the general shrinkage, none are found *post mortem*, and it would be strange indeed if an organ through which is passing the blood from a bowel filled with fermenting and toxic contents should continue to functionate normally. It is to be feared that the absence of colour has powerfully suggested other clinical states in which a similar condition of stool obtains, and in which the liver or its ducts play an important part. But, although devoid of colour, the sprue stool is not devoid of bile. In the whitest specimen the presence of bile acids may be demonstrated, and the very simple experiment of administering a purgative (preferably castor oil or senna, because of their small action on the chologenetic function of the liver) will bring about a series of dejections, the first of which will be white, but the later ones will be progressively more and more bile stained. If portions of this coloured stool be placed in sterile test-tubes and kept at body temperature for a few hours, the colour will be found to fade, and eventually disappear. Again, if similar portions of the same stool be placed in test tubes and an antiseptic added, no decolorisation occurs. The latter experiment may quite as easily, though more slowly, be carried out *in corpore*. An ordinary case of sprue diarrhœa is, without any preliminary treatment, subjected to a course of intestinal antisepsis by the administration of such drugs as chinosol, izal, cyllin, beta-naphthol or any reliable non-poisonous antiseptic, and in addition to the disappearance of all the untoward symptoms, the colour of the stools will gradually return commensurately with the degree of asepsis attained. It must be conceded that the absence of colour in a sprue stool is due in most part to a process of decolorisation which it undergoes in the bowel, and that as an index of the extent of interference with the functions of the liver it is fallacious. It is thus necessary to approach the question of the etiology of sprue from some other standpoint. Of all writers on this subject, Van der Burg alone mentions the matter of contagion only to negative it in a word. But it is worthy of greater consideration. As the cases in my records grew, and instance was added to instance of individuals who had been for a longer or shorter time in contact with sprue sufferers themselves taking the disease, the suggestion of a possible contagion gathered force.

(1) European female, been all her life in the tropics. Her father had long suffered from a mild type of sprue and she developed the disease at 17 years of age. She married shortly afterwards, and six years after marriage her husband develops the disease, with much rectal trouble.

(2) Father had had sprue for many years, and was a typical case. Daughter develops it soon after her marriage.

(3) Mother and daughter who have always lived together (Malays). Mother a typical example of gastric (constipation) sprue, and has had it all her life. The daughter first showed symptoms when she was 18 years of age.

(4) A very athletic young European who had never had a day's illness in his life, is cabin-mate during his first voyage to the East with an old sprue sufferer who had been home on leave. During the voyage out he performs the kindly office of painting the sore tongue of his cabin-fellow. Ten months after his arrival he develops the most virulent sprue, and, in spite of repeated voyages to Europe, dies exhausted some nine years later.

(5) European lady began to suffer two years after her husband first showed symptoms.

(6) In an Arab family we find a mother, aunt, cousin, daughter, and another female who bore no relationship, all having occasional subacute attacks developing on an underlying chronic sprue.

(7) In a Chinese family the mother had been affected since her youth. Her daughter first showed symptoms at 16 years of age. A daughter-in law, perfectly healthy when she joined the family, developed sprue within four years.

(8) European male. Had his first symptoms in 1899, and was sent home. While at home, and apparently cured, he married, and returned to the East. He had several slight outbreaks during the succeeding years. Five years after her marriage the wife developed a most acute sprue and had to be sent home.

(9) In an Eurasian family the mother was a typical

example of gastric sprue. Her two daughters frequently had sore mouths, but did not suffer severely until after their respective marriages. They are now well-marked cases of sub-acute sprue.

In the minds of those who have much to do with the disease, there exists little doubt that in sprue we have to deal with a specific micro-organism which has up till now eluded isolation.

As in all diseases of a like origin, aided perhaps by a cursory glance at the instances cited above, the question of heredity might be raised. But a closer scrutiny will clearly demonstrate the fact that the incidence of the disease in parent and child is purely a matter of accident, and that it really resolves itself into the only condition which is common to all the cases quoted, a prolonged and intimate contiguity.

"Interstate Medical Journal," June, 1905.

J. A. Matlack.

ACTINOMYCOSIS.

MRS. A., aged thirty-two, a farmer's wife, presented herself for treatment four months ago for multiple abscesses of the chest wall. These abscesses had existed for about three months, gradually growing larger, and discharging a thin whitish pus. Her general health had not suffered greatly, but she had a persistent cough, with profuse expectoration, which had existed for a month previous to the appearance of the abscesses. She also complained of a constant dull pain in the right side.

Examination of the chest showed five or six red, angry-looking swellings from one to two inches in diameter, extending in a line at the level of the seventh and eighth ribs posteriorly on the right side, discharging thin pus through numerous small openings resembling somewhat the breaking down of a carbuncle, the little apertures being fringed about with outgrowths of peculiar bluish, soft granulation tissue. The pus contained numerous greyish granules about the size of a pinhead. Physical examination of the chest showed signs of pleuritic effusion, extending as high as the fifth rib posteriorly on the right side, with coarse râles over the middle portion of the lung.

The sputum was light-coloured and watery, and was filled with granules similar in appearance to those found in the pus. Microscopic examination of these granules from both pus and sputum showed them to be colonies of ray fungi.

The fact that the pulmonary symptoms appeared a month prior to the development of the abscesses makes out a clear case of actinomycosis primarily affecting the lung, thence extending to the pleura and finally penetrating the chest wall.

No clue as to the source of infection could be obtained from the patient's history. The patient was placed on small doses of potassium iodide, rapidly increasing the dosage from day to day. She showed at once a remarkable tolerance to the drug, and also began to show improvement after a very few days of treatment. The cough disappeared, the abscesses healed with the exception of one small opening, and the patient's general condition is quite good. The only physical abnormality to be noted is an area of relative dulness over the site of the former pleuritic effusion. T. P. B.

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THE

Journal of Tropical Medicine

OCTOBER 2, 1905.

THE INCORPORATION OF "*CLIMATE*" WITH THE *JOURNAL OF TROPICAL MEDICINE.*

BY the subjoined letters it will be seen that the Quarterly Journal *Climate*, devoted to health and travel in warm countries, which has been ably edited and conducted by Dr. Charles F. Harford, of Livingstone College, ever since he founded the Journal some six years, is to be discontinued. The reason for the discontinuance is the fact that Dr. Harford has recently taken up other responsible public duties which altogether absorb his spare moments. Many will regret the disappearance of *Climate*, which has been conducted in a manner that has interested and served to guide and help numbers of tropical residents to a better knowledge of how to lead healthy lives in warm countries.

It would be a great loss were no provision

made to continue to convey the instruction and information *Climate* afforded, and it is to meet this contingency that the Editors of the JOURNAL OF TROPICAL MEDICINE have advised the Publishers to devote certain numbers of the Journal to general hygiene in the tropics.

LETTER FROM DR. HARFORD, EDITOR OF *CLIMATE*.

Livingstone College,
Leyton, E.
September 25th, 1905.

TO THE EDITORS OF "THE JOURNAL OF TROPICAL MEDICINE."

GENTLEMEN,—I desire to inform you that *Climate*, the Quarterly Journal of Health and Travel, which I have had the honour to edit for the past six years, is to be discontinued at the close of this year. This journal, as you are aware, has had for its object the diffusion of information concerning questions of climate and hygiene, including such subjects as food supply, clothing, sanitation and house building, and it has dealt very fully with the problems of protection from mosquitoes, and the prevention of malaria and other tropical diseases. It has also provided information concerning the causation, symptoms and treatment of the most important diseases of warm climates.

Climate was intended primarily to provide information on these subjects for residents or travellers in tropical climates who are obliged to study these problems, and yet who have not the technical knowledge which would enable them to appreciate ordinary scientific articles in the medical press. At the same time a large number of our readers are members of the medical profession and the subjects dealt with are of equal interest to strictly professional readers, and to those who are placed as already mentioned.

The only reason for the discontinuance of *Climate* is the fact that I am personally too much occupied to devote the time necessary for its publication, and I am exceedingly anxious that the readers of *Climate* should have some opportunity of obtaining in the future the information which we have provided for them in the past in our columns. Many of our readers are in most influential positions, and when it is realised how much the carrying out of measures of sanitary reform depends upon the co-operation of the administrators and public officials in our colonies, and the European residents generally, it is clearly a matter of the first importance that they should have access to some reliable publication which will give them the facts which they ought to know.

I hope, therefore, that it may be possible to make some arrangement by which THE JOURNAL OF TROPICAL MEDICINE may issue some numbers every year which could be supplied to our old subscribers if they were willing to transfer their subscription, and which would specially deal with the subjects above enumerated. I cannot help thinking that discussions in certain specified numbers on hygienic and climatic subjects would be of interest to your own readers, and would certainly be of benefit to ours.

If you are willing to do this we are willing to transfer to you all the interest of *Climate*, and we will do our best to induce our readers and others to subscribe at least for these special numbers.

I am making this offer with the cordial approval of the Committee of Livingstone College, under whose auspices *Climate* has been published, and also with the hearty concurrence of my colleague, Dr. Basil Price, who has co-operated with me recently in the issue of this journal.

I am, yours faithfully,
CHARLES F. HARFORD,
Editor of *Climate*.

TO THE EDITOR OF "CLIMATE."

September 26th, 1905.

DEAR DR. HARFORD,—We beg to acknowledge your letter in reference to the discontinuance of *Climate* at the end of the year. We have been so accustomed to look forward to the interesting numbers of *Climate* for the past six years that we regret to think that a journal devoted to work in a corresponding field to our own is to be discontinued. *Climate*, to our positive knowledge, has proved welcome to readers in many parts of the world, and we are sure the announcement that *Climate* is to be discontiuued will be received with sincere regret. Anything we can do, to in any way fulfil and carry on the scheme of work which *Climate* has made peculiarly its own, we are willing and anxious to do. Our suggestion is that we announce that *Climate* is incorporated after January 1st, 1906, with THE JOURNAL OF TROPICAL MEDICINE; that we issue yearly four numbers of the JOURNAL specially devoted to the field hitherto covered by *Climate*; that these "general hygiene" numbers be issued on January 15th, April 15th, July 15th, and October 15th; that these four numbers be obtainable by non-subscribers to THE JOURNAL OF TROPICAL MEDICINE by the payment of a proportionate and separate subscription. We hope this scheme will be acceptable to you and your readers.

We are, yours faithfully,
JAMES CANTLIE,
W. J. SIMPSON,
Editors JOURNAL OF TROPICAL MEDICINE.

Reviews.

VERIFYING DEATH.

LE DANGER DE LA MORT APPARENTE SUR LES CHAMPS DE RATAILLE. (The danger of apparent death on the battle-field). By Dr. ICARD, of Marseilles. 1905.

Dr. Icard, whose name is a household word in France by reason of his many writings on medical jurisprudence, especially those on the subject of the verification of death and of the dangers of premature burial, has written this small book with a view chiefly of preventing this occurrence taking place on

the battle-field, and his procedure supplies us with an absolute guarantee against a wounded soldier being buried alive; his method also is at the same time harmless, easy of application, quick in action, and practically infallible in results. In fact, so simple and certain is this method of verifying actual death, that it can also be readily applied in hot countries where burials are apt to be carried out in haste—especially during epidemics—without waiting for putrefaction to set in.

Dr. Icard's method consists in a subcutaneous injection of *fluoresceine*, a substance which he has proved to be absolutely harmless and one capable of being kept indefinitely if in an alkaline solution. The injected body (*if still alive*) takes on an appearance of intense jaundice, owing to the skin and mucous membranes acquiring a deep yellow discoloration, whilst the eyes are changed to a brilliant emerald green.

The formula is:—

Fluoresceine	10 grammes.
Carbonate of Soda	15 grammes.
Distilled Water	50 cubic centimetres.

Eight to ten cubic centimetres of this sodic solution are deeply injected into the muscles or cellular tissue, and for preference into the epigastric hollow. The slowness of the circulation is compensated for by the marvellous colouring power of the injected fluoresceine, which is readily perceptible in a solution of a strength of even 1 in 45,000,000 (one in forty-five millions). The drug is gradually eliminated by the skin and kidneys, the execretions of which acquire a greenish tinge.

The book is an interesting one to read and can be obtained of A. Maloine, 25, Rue de l'Ecole de Médecine, Paris. Price 2s. Postage extra.

J. E. N.

THE PREVENTION OF CHOLERA, AND ITS TREATMENT. By Lt.-Colonel J. DUKE, I.M.S. (retd.) Third Edition, enlarged. Thacker, Spink and Co., Calcutta. 1905. Pp. 28. Price 8 annas.

The appearance of a new edition of Lt.-Colonel Duke's well-known pamphlet on cholera is opportune. The disease threatens Europe, and in many parts of the near East as well as in India cholera has recently declared itself. Colonel Duke in his account of the Prevention of Cholera states that the cholera microbe outside the human body, so far as is known, only lives and reproduces in water.

Taking this fact as his text, he shows how to deal with drinking water so as to render it safe, and points out that everything that is *wet* should be suspected as a possible carrier of the disease. The microbe is destroyed by boiling, by drying, and by exposure to acid solutions. The periodical disinfection of wells by permanganate of potassium is carefully and simply told, and the disinfection of drinking vessels, milk, curds, mussucks (water skins), buckets, houses, mud floors and clothing is discussed and described in a manner understandable by all.

Under the title of "Addenda," the treatment of a case of cholera is given in detail. As the microbe of the disease thrives in alkaline medicines and is killed by acids, mixtures of an acid nature are to be given and calomel and Indian hemp are in some cases particularly beneficial. A favourite prescription is calomel grs. ii, ext. Indian hemp gr. $\frac{1}{2}$, and ext. gentian (or taraxaci) grs. ii, or hydrargyri iodidi rubri gr. $\frac{1}{6}$, ext. Indian hemp gr. $\frac{1}{2}$. Colonel Duke cites an outbreak of cholera in which, of cases treated by calomel and Indian hemp, 70 per cent. recovered, whilst the deaths amongst those who had not this treatment 73 per cent. died. Colonel Duke's book ought to be in the hands of every one when cholera threatens, and the instruction and advice it gives followed implicitly.

THE PRACTICAL STUDY OF MALARIA AND OTHER BLOOD PARASITES. By J. W. W. STEPHENS, M.D.Cantab., D.P.H.; WALTER MYERS, Lecturer in Tropical Medicine, University of Liverpool; and S. R. CHRISTOPHER, M.B.Vict., I.M.S. University Press of Liverpool. 396 pp. and xliv. pp. Second Edition. Net price 12s. 6d.

The new edition of this admirable text-book contains several important additions. Of these we note especially descriptions of many new Anophelines, mosquito genera, hæmogregarines, trypanosomata, &c., and an account of Schaudinn's investigations on halteridium.

The chapter on the Leishman-Donovan bodies will be welcomed by students of tropical medicine, for they will find a succinct account of the signs and symptoms these bodies give rise to, and a coloured plate illustrative of the anatomical features of the parasite.

Chapter XXIX. deals with spirillar fever and the spirochætes found in the blood of persons suffering from spirillar fever.

In the appendix valuable information will be found concerning blood-sucking flies, and directions for the preparation and use of stains and of numerical data.

The second edition of this book maintains the eulogium passed upon the first edition, and its value is enhanced by the addition of four new coloured plates, and by the fact that it brings our knowledge of the subjects it deals with up to date.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"El Siglo Medico," of Madrid, August 19, 1905.

TREATMENT OF LEPROSY BY MANGROVE.

"El Mangle (*Rhizophora mangle*, Linn.) en el tratamiento de la lepra." On the Treatment of Leprosy by Mangrove. By Dr. Sixto Padilla, of Ahuachapán, San Salvador, Central America.

Dr. Padilla commences his important work by recording the special studies of Dr. Aguirre-Velasquez

and Dr. Mauricio on this subject, and also the communication of Dr. Duque and Dr. Moreno to the Pan-American Medical Congress from which the following interesting passages are taken.

"The effects of mangrove on leprosy are as follows. At first, if administered in large doses to commence with, it produces nausea, lassitude, vomiting, and purging, which, however, disappear with the suspension of the treatment. For this reason it is always advisable to commence with small doses, in order to gradually accustom the patient to the drug.

"The first thing the patient experiences after fifteen to twenty days' treatment is an unaccountable feeling of cheerfulness apparently without cause for the same, and without doubt he has a better appetite, and the lepralgic pains are not so severe, he feels active and disposed to carry on his usual occupation. The following month the patient is another man; he has put on flesh, eats well, digests well, sleeps well, and works without feeling weary; the spots have become somewhat rose-coloured, more so in the periphery than in the centre, and those which are confluent tend to separate, leaving large intervals of healthy skin between each other; if there are any ulcerations suppuration is diminished in them, they lose their dark colour and take on a bright red hue, and the inflammatory areola disappears, the lepromata undergo a transformation, the fresh nodules are not so extensive, and the fever usually present on these occasions almost entirely disappears. Following up the treatment, the improvement becomes more marked, the periodic crops of lepromata disappear definitely from the fifth to the seventh month of treatment, and the lepro-tuberculomata disappear in two ways, either by becoming inflamed, painful and suppurating, or else they undergo fatty degeneration and become absorbed, leaving behind them in each case a white scar with a faint rose-coloured tint. Sometimes they become encysted and calcified, necessitating their removal by incision; the ulcers about the eighth month of treatment have healed up. The anæsthesia has completely disappeared. At the ninth month, according to Drs. Duque and Moreno, the alopecia ceases, and the eyelashes and eyebrows grow again. What is most noticeable in these patients is the return of the face to its normal condition, for it would at first seem impossible that faces with a skin like parchment, which give this characteristic and repulsive aspect, could return in a relatively short time to their normal condition with a fine skin. In a year, according to these same Cuban physicians, the patient is generally cured."

Dr. Padilla now gives an account of three cases which came under his own personal observation. The first of these patients was under treatment for ten months, the second one for seven months, and the third for barely six months, and he states that the first and third cases gave the best possible results; but in the case of the second patient it was noticed that scarcely any hairy down reappeared on his body, nor did his eyelashes and eyebrows make much progress as regards growth. The first case occurred in a man aged 32 years, a widower, and a field labourer, with no family history whatever of the infirmity from which he suffered, which he believed he contracted from a female servant who lived in his house. His two sons, one aged 11 years and the other 9 years, are both healthy.

He stated that the first manifestations that he noticed occurred about six years ago, commencing in the left cheek, and about two months later in the right cheek, and that these were like thick ridges which increased until they covered the whole of his face, and were accompanied with painful pustules which afterwards disappeared. A year afterwards he had more spots, which spread to the nose and ears, taking on a blackish tint with scales which had disfigured his nose, and some ulcerated nodules on his ears, and also scattered over many parts of his body including his nails, and certain affected parts were also attacked by local inflammation. Dr. Padilla diagnosed the case as one of tubercular leprosy in its third stage, and he commenced treatment by 30 grammes of mangrove boiled in 120 of water, to be taken daily; this was done for twelve days. For another similar period the dose was increased to 45 grammes daily, and then for another ten days to 60 grammes a day. After this the fluid extract was used, commencing with 20 grammes daily, the dose being gradually increased up to 45 grammes in a month's time; a great improvement was now observed, including the reappearance of the downy hair, the swelling of the feet disappeared, the patient enjoyed a good appetite and slept well, was very cheerful, and was now able to attend to his usual occupations. The fluid extract was now changed for the dry in doses of 2 grammes daily, which were gradually increased up to 7 grammes in the next two-and-a-half months. Eleven months after the commencement of the treatment the patient was the first to ask for its suspension, since he felt and appeared to be thoroughly restored to health.

J. E. NICHOLSON.

"*Journal of the Royal Army Medical Corps*," *June*, 1905.

1. The Direct Transmission of Enteric Fever. By Lieutenant-Colonel A. M. Davies, R.A.M.C.

2. Researches on Malaria. By Major Ronald Ross, C.B., F.R.S., D.Sc., I.M. S. (Retired).

3. Report on the Prevalence of Enteric Fever in Bermuda, with Tables and Diagrams. By Major J. W. Cockerill, R.A.M.C.

4. The Spread of Enteric by Latrine Infection. By Colonel R. H. Quill, R.A.M.C.

(1) The general opinion up to 1870 was that typhoid infection from patient to patient, or from patient to nurse, was extremely rare. Since that date, however, evidence of direct transmission of disease has increased. This may be accounted for either by faulty diagnosis or observation, or it may be that a change has taken place in the nature of the disease, or in the bodily constitutions of the persons exposed to infection, so that the present generation is more receptive of infection than was formerly the case. The establishment of the belief that typhoid is directly infectious implies the necessity for the adoption of Koch's stamping-out method by early detection of the disease, notification, isolation and disinfection.

(2) Ross describes his work in India in connection with the mosquito-malaria theory of Manson, the

present communication (in the June, 1905, number of the *Journal of the Royal Army Medical Corps*) being the concluding statement. It is well to have an account of this all-important discovery clearly stated, for few facts in the history of medicine have had more far-reaching effects.

(3) Cockerill states that the cases usually diagnosed simple continued fever in Bermuda are in the large majority of cases mild enteric fever. During the period from 1884 to 1893 typhoid appeared chiefly in autumn, and was attributable to contaminated drinking water; since 1893 the disease occurred mostly in summer, being chiefly due to flies and contaminated dust. In Bermuda typhoid fever occurred amongst men of an older age than is usually disclosed.

"New York Medical Journal."

INTERMITTENT ANGIOSPASM ON THE BASIS OF CHRONIC MALARIA. By F. Schwyzer, M.D.

By angiospasm is meant the disturbance of the vaso-motor nerves caused by chronic malaria. Schwyzer describes a series of cases.

Case 1.—Man with malarial history had a sudden feeling of numbness (loss of sensation) in the right arm, followed by a similar affection of the right leg, tongue and gradual aphasia. The symptoms wholly disappeared within two hours. Two days later a slight recurrence of symptoms, and again, two days afterwards a slight aphasia recurred. Malarial parasites were present in the blood. Quinine lessened severity of attacks, but feelings of formication, &c., remained for some weeks. The left arm was involved during the course of the disease.

Case 2.—During the autumn of each year the patient for many years had some numbness and formication in the extremities.

Case 3.—Suddenly lost power of speech.

Case 4.—Numbness in limbs and aphasia.

Case 5.—Numbness in arms accompanied by nausea and vomiting recurring every second day at the same hour.

Case 6.—Numbness in limbs and aphasia.

Case 7.—Numbness in limbs, head and tongue.

Case 8.—Numbness in right arm and leg, vertigo and some aphasia.

In all these cases a history of malaria was obtained, and in the majority malaria parasites were actually found in the blood. In none of the cases, excepting the aphasia, was there any motor disturbance. Quinine afforded relief in every instance and in most cases cured.

"The Practitioner," August, 1905.

PATHOLOGICAL VARIATIONS OF PHYSIOLOGICAL VASO-MOTOR ACTION, WITH SPECIAL REFERENCE TO THE MALARIAL PAROXYSMAL NEUROSES. By Francis Hare, M.D.

Hare remarks that the most conspicuous manifestation of malaria is the rigor. In rigor there is intense vaso-constriction of the cutaneous area and the radial artery is tightened up. The corresponding dilated area is in all probability the muscular layer of the body. In this belief Hare affirms that there is a malarial migraine; that asthma and angina pectoris may depend upon malaria; that there is a well-marked malarial epilepsy and many forms of neuralgia, trigeminal and others, can be explained by priority of vaso-motor action. In these affections there is apt to be vaso-constriction more or less widely generalised, associated with a vaso-dilatation more or less localised at the seat of pain. Gastralgia, Raynaud's disease, recurrent temporary amblyopia, erythromelalgia and urticaria, all of which are essentially of vaso-motor mechanism, may depend on malaria.

Books and Papers Received.

FIRST ANNUAL REPORT OF THE HENRY PHIPPS INSTITUTE FOR THE STUDY, TREATMENT AND PREVENTION OF TUBERCULOSIS. Philadelphia: 238, Pine Street. 1905. Pp. 265.

GLANDERS: ITS DIAGNOSIS AND PREVENTION TOGETHER WITH A REPORT ON TWO CASES OF HUMAN GLANDERS OCCURRING IN MANILA, AND SOME NOTES ON THE BACTERIOLOGY AND POLYMORPHISM OF BACTERIUM MALLEI. By W. B. Wherry, M.D. Bureau of Public Printing, Manila. 1904. Pp. 25. Illustrated.

A CATALOGUE OF ASEPTIC FURNITURE, STERILISERS, &C., SUITABLE FOR THE OPERATION THEATRE AND WARDS OF HOSPITALS, ALSO FOR THE CONSULTING ROOM. Down Brothers, Limited, 21, St. Thomas's Street, London, S.E. 1905.

Miscellaneous.

SCURVY.

AN OLD-TIME DESCRIPTION OF THE DISEASE.

Anson's "Voyage Round the World," book i., ch. x., 1740-1744.

"Soon after our passing Straits le Maire the scurvy began to make its appearance amongst us. . . . . The mortality went on increasing, and the disease extended itself so prodigiously that after the loss of above two hundred men we could not at last muster more than six fore-mast men in a watch capable of duty.

"This disease, so frequently attending all long voyages, and so particularly destructive to us, is surely the most singular and unaccountable of any that affects the human body. For its symptoms are inconstant and innumerable, and its progress and effects extremely irregular: for scarcely any two persons have the same complaints, and where there hath been some conformity in the symptoms the order of their appearance has been totally different. However,

though it frequently puts on the form of many other diseases, and is therefore not to be described by any exclusive and infallible criticisms, yet there are some symptoms which are more general than the rest; and therefore, occurring the oftenest, deserve a more particular enumeration. These common appearances are large, discoloured spots dispersed over the whole surface of the body, swelled legs, putrid gums, and, above all, an extraordinary lassitude of the whole body, especially after any exercise, however inconsiderable; and this lassitude at last degenerates into a proneness to swoon on the least exertion of strength, or even on the least motion.

"The disease is likewise usually attended with a strange dejection of the spirits, and with shiverings, tremblings, and a disposition to be seized with the most dreadful terrors on the slightest accident. Indeed, it was most remarkable, in all our reiterated experience of this malady, that whatever discouraged our people or at any time damped their hopes never failed to add new vigour to their distemper; for it usually killed those who were in the last stage of it, and confined those to their hammocks who were before capable of some kind of duty; so that it seemed as if alacrity of mind and sanguine thoughts were no contemptible preservations from its fatal malignity.

"But it is not easy to complete the long roll of the various concomitants of this disease; for it often produced putrid fevers, pleurisies, the jaundice, and violent rheumatic pains, and sometimes it occasioned an obstinate costiveness, which was generally attended by a difficulty of breathing; and this was esteemed the most deadly of all the scorbutic symptoms. At other times, the whole body, but more especially the legs, were subject to ulcers of the worst kind, attended with rotten bones, and such a luxuriancy of fungous flesh, as yielded no remedy. But a most extraordinary circumstance, and what would be scarcely credible upon any single evidence, is that the scars of wounds which had been for many years healed were forced open again by this virulent distemper; of this there was a remarkable instance in one of the invalids on board the *Centurion*, who had been wounded about fifty years before at the battle of the Boyne; for though he was cured soon after, and had continued well for a great number of years past, yet, on his being attacked by the scurvy, his wounds, in the progress of his disease, broke out afresh, and appeared as if they had never been healed: nay, what is still more astonishing, the callus of a broken bone, which had been completely formed for a long time, was found to be hereby dissolved, and the fracture seemed as if it had never been consolidated. Indeed, the effects of this disease were, in almost every instance, wonderful; for many of our people, though confined to their hammocks, appeared to have no inconsiderable share of health, for they ate and drank heartily, were cheerful, and talked with much seeming vigour, and with a loud, strong tone of voice; and yet, on their being the least moved, though it was only from one part of the ship to the other, and that in their hammocks, they have immediately expired; and others, who have confided in their seeming strength, and have resolved to get out of their hammocks, have died before they could well reach the deck; and it was no uncommon thing for those who were able to walk the deck and to do some kind of duty to drop down dead in an instant, on any endeavour to act with their utmost vigour; many of our people having perished in this manner during the course of this voyage."

This exceedingly dramatic, but apparently unexaggerated account of scurvy in all its terrors, was probably written by Benjamin Robins, a celebrated engineer officer, though the author's name on the title-page is "Richard Walter, M.A." By whomsoever it was written—and no medical man could have given a better description—it is excellent, and reminds one much of Defoe's account of the plague in London.

J. Burton Cleland.

EXCHANGES.

Annali di Medicina Navale. Annali d' Igiene Sperimentale Archiv für Schiffs u. Tropen Hygiene. Archives de Médicine Navale. Archives Russes de Pathologie, de Médec. Clinique et de Bacteriologie. Australasian Medical Gazette. Boletin de Medicina Naval. Boston Medical and Surgical Journal. Bristol Medico-Chirurgical Journal. British and Colonial Druggist. British Journal of Dermatology. British Medical Journal. Brooklyn Medical Journal. Caducée. Climate. Clinical Journal. Clinical Review. Giornale Medico del R. Esercito. Hong Kong Telegraph. Il Policlinico. Indian Medical Gazette. Indian Medical Record. Indian Public Health. Interstate Medical Journal. Jahresbericht. Janus. Journal of the Royal Army Medical Corps. Journal of Balneology and Climatology. Journal of Laryngology and Otology. Journal of the American Medical Association. La Grèce Médicale. Lancet. Liverpool Medico-Chirurgical Journal. Medical Brief. Medical Missionary Journal. Medical Record. Medical Review. Merck's Archives. New York Medical Journal. New York Post-Graduate. Pacific Medical Journal. Polyclinic. Public Health. Revista de Medicina Tropical. Revista Medica de S. Paulo. Sei-i-Kwai Medical Journal. The Hospital. The Northumberland and Durham Medical Journal. Transactions of the American Microscopical Society. Treatment. West India Committee Circular. West Africa.

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3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the Journal of Tropical Medicine should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communications.

SCIENTIFIC RESEARCH IN MEDICINE.

Introductory Address.

LONDON SCHOOL OF TROPICAL MEDICINE.

By GEORGE H. F. NUTTALL, M.A., M.D., Ph.D., F.R.S.

for the Session Commencing October, 1905.

IT is a pleasure and an honour for me to address you at the opening meeting of your nineteenth session, and I thank you for giving me the opportunity. Coming from Cambridge, where the importance of tropical medicine has been fully recognised by the institution of a University diploma in tropical medicine and hygiene, I feel that this is an occasion which can but strengthen the bonds that unite us in the desire to further our common object. I have chosen as a subject for to-day's address "Scientific Research in Medicine," for my own work has been mainly connected with research.

That great benefits to mankind have followed the discoveries of recent years is obvious to all of us, especially with regard to the cause and prevention of yellow fever and malaria, and the results already obtained give abundant promise of the good that may result from like researches in the future. Research is a word we hear on all sides to-day. It is the enemy of mere *authority*, that tyrannous spirit which has hampered progress and retarded the advance of scientific medicine for centuries. The spirit of research is restless of restraint, it chafes at limits, it leads us ever onward to new questionings and new discoveries, and these in turn lead on to further inquiries. The spirit of research has come to stay with us as long as the hope and the desire of progress, in any domain of human knowledge, continue to stir the minds of men.

Experimental medicine is responsible for the greatest advances which have been made in our knowledge of the cause, prevention, and cure of disease. These advances have been based on the labours of many workers, exploring often along different lines. Most important discoveries have exerted but a slight direct effect at their inception; their full significance has remained hidden, except perhaps to the few and far-seeing. Of such discoveries the majority have been made by those engaged in research in the realms of pure science, and rarely by those guided by principles of direct and immediate utility. Pure science is in this respect unselfish; its aim is not profit, but truth; it makes for light rather than for gain; yet it is the forerunner of that applied science which is more obtrusively the servant of man. Its guiding principle is that knowledge must be sought for its own sake, and not primarily for its possible or probable applications. And experience has shown that new and fruit-bearing knowledge is seldom revealed to those whose sole purpose is merely utilitarian.

Problems of the greatest importance to humanity are awaiting their solution at the hands of those who are willing to labour thus unselfishly, to devote themselves to science for the sake of science, and not for that of the material service which science can be made to yield. If we study disease, we must study disease for the sake of knowledge; the scientific spirit must enter into our work. Devotion to the study, actuated by such motives, is certain to bring its reward, although the reward may not be material. It seems scarcely necessary to dwell on this before an audience composed chiefly of men belonging to the medical profession, which of all the professions is the most unselfish. All that can be asked is that those who devote themselves to advancing the science of medicine shall bring to their work the same noble motives which guide the ideal physician in his efforts to alleviate the sufferings of his fellow men. The spirit of commercialism should be as foreign to the man of science as it is to the physician, for both should be idealists in the best sense of the word. The fruits of their labours may be gathered by others, but none can rob them of the joy of having brought them forth. The "practical man" may not appreciate such ideals, he may deride those who cherish them; but he is ever ready to use the discoveries of science for his own ends. The reward of the true pioneer does not lie in what is said by "the fool multitude who choose by show"; he seeks only "the wages of going on"; he finds his recompense in delving into the wonderland of nature with all its hidden beauties, and thereby forgetting the smallness that enters into all men's lives. And there is no meanness in the exultation of the explorer when a new peak rises on his view, of the searcher of the skies "when a new planet swims into his ken." The joy of the hunter at the kill is felt by the scientific worker when a fact which has hitherto escaped observation rewards his patient search for truth.

Research has also its joys in the ever-changing picture that it brings before us; the phenomena we study fascinate through their very elusiveness. We must be prepared for many disappointments and much labour lost; we must be ready to give up much of the old, if we wish to grasp the new. We must grow with our growing knowledge, *per ampliora ad altiora*. We must emulate the chambered nautilus:—

> Year after year beheld the silent toil,
> That spread his lustrous coil:
> Still, as the spiral grew,
> He left the past year's dwelling for the new,
> Stole with soft step its shining archway through,
> Built up its idle door,
> Stretched in its last found home, and knew the old no more.
>
> O. W. HOLMES.

We are not all born with instincts fitted for research, but there are many in whom the talent for investigation lies dormant and unused. It should be one of the functions of educational institutions to detect such men, and to lead them on to do the work for which they are adapted, to place the torch within the grasp of hands that are fit to bear it onwards.

ENDOWMENT OF RESEARCH NEEDED.

All who are engaged in teaching and research have met with such men, and often with regret have been forced to see them drift away into other fields of activity, too often from mere lack of means to offer them encouragement. In this country we constantly see men abandon research for practice, though it is all too obvious that, in the interest of science, we cannot afford to lose them. In such cases the distinction attained by research is used but as a stepping stone to

positions which shall secure a means of livelihood. To carry on research successfully a man needs an assured income, so that his mind may be at peace with regard to his material wants. How little encouragement is needed to bring forth such men is seen to-day in many parts of the world. I need scarcely remind you of the devotion to work for its own sake exhibited by such men as Lazear, Myers, Dutton, Plehn, and others, who have sacrificed their lives in the study of tropical medicine. These men consciously risked their lives in their devotion to science, they sacrificed themselves for humanity, and there are many who are prepared to follow in their footsteps.

Is it possible that those who are able and willing to help on human progress can continue to ignore the devotion and self-sacrifice which such men are all too ready to render to their fellow men. We should do all in our power to bring the need in this respect before the educated public, in whose mind there still exists no proper understanding of the material conditions that render scientific research and discovery possible. The average man is scarcely interested in *how* discoveries are made, provided that they *are* made; but an appeal to him based on grounds of public benefit may meet with success; and such an appeal is justified by what has been accomplished.

The needs of experimental medicine are so great and urgent that every means short of the undignified should be taken to bring the matter forcibly before the public, which in this country does so much for charity, so pitiably little for the advancement of learning. Medical research needs endowment. For those who are willing to devote their lives to research, means of subsistence should be found in the interest of the public good. In the regrettable absence of State aid we are forced to appeal to the intelligent public, proving again and again that we need help and still more help, and that we are worthy to receive it at their hands. In this appeal all medical men should join.

The wealthy classes of this country would do well to imitate their brethren in America, where, though the State does much more for learning, private beneficence has nevertheless come to the fore in splendid fashion, endowing universities, institutes, and laboratories in a truly regal manner. It is high time that medical science should become a more favoured object of benevolence in this country.

Our Laboratories and Teachers.

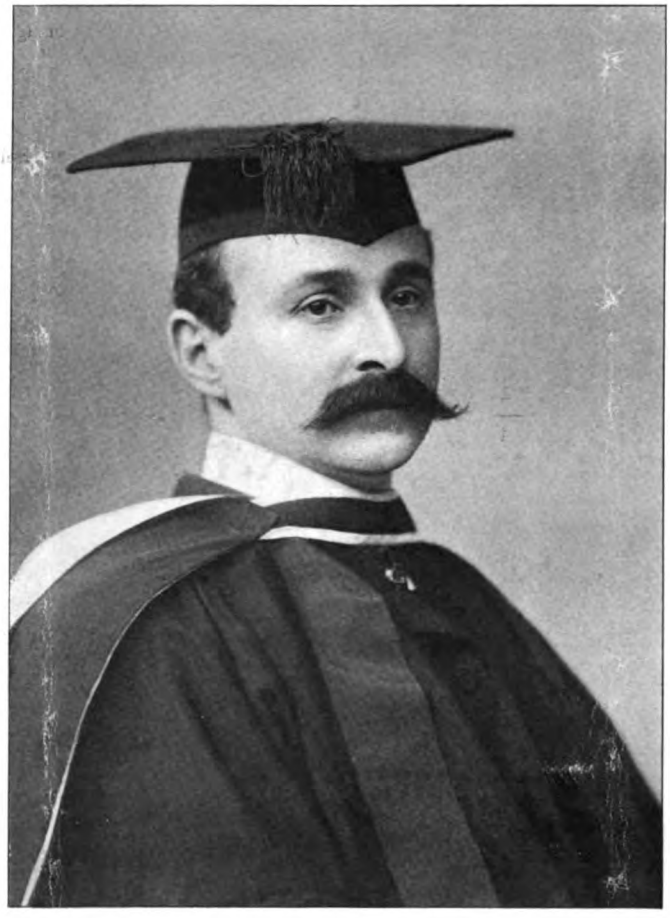
In an address delivered by my friend, Professor W. H. Welch, of Johns Hopkins University, some nine years ago, he said :—

"At the present day no country, no university, no medical school, can hold even a respectable place in the march of education and progress unless it is provided with suitable laboratories for scientific work."

Laboratories are the workshops of those who engage in research, although there are some in which much routine work is done and original research neglected. Laboratory work alone does not constitute research. Laboratories should be thoroughly equipped and guided by men of capacity, by well-trained teachers and investigators who can give their whole time to the work, not by men "deep versed in books and shallow in themselves." The teachers should be men capable of fostering the scientific spirit in medicine and of training the students under them in objective methods. For this purpose the best teachers are unquestionably those who are also investigators, but to fulfil both the functions of teacher and investigator requires so much time that it is almost impossible to perform any other duties. A non-investigator may cram his students excellently for such purposes as examinations, but he will not stimulate his men to progress in independent thought and work. To teach science as it should be taught in properly equipped and organised institutions is far more expensive in the case of medicine that in that of any other professional school; and this is the reason why support is so much required—pure science does not pay for the material needs of those who cultivate it.

In former times our needs were fewer, but it no longer holds true that "what was good enough of old is good enough yet." The result of clinging to the old traditions has brought about an untenable position amongst science teachers in this country. In many of our institutions one man is often expected to perform duties which in more enlightened Germany are allotted in two, three, or even more teachers, each provided with a living wage apart from the necessary support given for their laboratories. Most teachers of science in this country receive pittances of which few are sufficient, many totally inadequate. The same holds for many of our laboratories, which remain ill-provided with the means of making use of the costly bricks and mortar of which, in some cases, they are constructed. I know of cases where even university teachers have to sacrifice a large share of their insufficient salary in carrying on the work of research in their laboratories. It does not suffice to *build* laboratories, they must also be provided with sufficient funds and equipment to enable them to become working entities. In brief, we need living laboratories; we must see that the teacher is supported in a manner commensurate with his functions, and that aid, however modest, is found for such students as show marked talent for research.

I have cited conditions in Germany as an instance of what is done in a neighbouring country by a "paternal government." A closer study of these conditions should certainly tend to ruffle the national pride of an Englishman. Take a single instance with which I am especially familiar—the hygienic laboratories. In May of this year the new Hygienic Institute of the University of Berlin was opened. The building, which contains all modern appliances, was constructed at a cost of £35,000. Ten years ago the Institute received £925 per annum for current expenses, this year the *Etat* has been brought up to £1,750 per annum; this apart from the salaries to the teaching body, and apart from grants for special investigations. Every German university and most towns of importance are provided with Hygienic Institutes, all, as far as practicable, supplied with means adequate to enable them to perform their useful functions. Even in poverty-stricken Italy practically every university is provided with a Hygienic Institute, which serves, as in Germany, as an active centre for research and teaching. Compare this with what is found in this country. There are hygienic laboratories in Edinburgh and Manchester, which



GEORGE H. FALKINER NUTTALL, M.A., M.D., Ph.D., F.R.S.,

University Lecturer in Bacteriology and Preventive Medicine, Cambridge.

Dr. NUTTALL delivered the Inaugural Address at the opening of the Winter Session, October 11th, 1905.

may modestly compare with some of the institutions abroad. Take Oxford and Cambridge, our oldest universities, and we see that no provision exists for research or even proper teaching in hygiene. It seems inconceivable to outsiders that these universities are poor, and cannot found new institutions, and that there are other and perhaps more pressing needs. All I can say, in the words of a talkative Irish patient I knew, "Poverty is no disgrace, but it is mighty unhandy"; and we must continue to hope for better days! We in Cambridge are earnestly hoping that a helping hand may soon be extended to the relief of a condition which cannot persist.

The London School of Tropical Medicine and its Students.

Those of us who have watched the progress of this school from its inception have witnessed a struggle upward which is worthy of all praise and felicitation. This and the sister institution in Liverpool are known throughout the world for the excellent work accomplished by the members of the teaching staffs and some of the students they have sent forth. Your school has a great mission to fulfil. It has to train men in the methods they will be called upon to employ in many parts of the world, and to give them the latest and the best to take with them on their distant journeys. The amount crowded into your courses already shows the rapidly increasing importance of the subjects treated, and the need, some day in the future, of making certain modifications in the plan of study so as to relieve the increasing burden on the teacher and student.

It is to be hoped that the public will second the noble efforts you have made to establish a centre for the study of the diseases which affect the inhabitants of the tropical countries of this vast empire. You have already made your influence felt throughout the world, for the men trained within these walls are constantly being distributed over the empire, and occupy places where they will continue to transmit the stimulus which radiates from this institution. We are at length beginning to see the dawn of better days, when we ourselves can supply men to solve the great problems which it is our duty to investigate without calling in, as heretofore, the men whom Germany and France have trained and lent us in our helplessness.

> How many things by season season'd are
> To their right praise and true perfection!
> (Merchant of Venice, V., I.)

There is much for us to do before we reach "perfection," and we must continue to strive onward and upward. I should like to see some means devised, for instance in this school, to maintain a form of union between those who have enjoyed the opportunity of studying in its laboratories, to see arise a feeling of corporate attachment between the institution and those who have passed through its portals. This might be accomplished by the publication of a Bulletin or the like, which would serve to keep the men in touch with each other and with their teachers after they have left the school. This school, for its part, would surely benefit by fostering the ties which unite it with its former students. The grown-up sons who are out in the world would be encouraged to remember, and on occasions to support and assist their *alma mater*.

The examination which we have instituted at Cambridge cannot fail to react upon the schools where tropical medicine is taught in the direction of broadening and deepening the knowledge imparted to those destined to present themselves as candidates. For instance, it has already become obvious to us that the subjects of tropical hygiene and bacteriology require more attention than they have received at the hands of those desiring to attain our diploma. It is fully recognised that there are difficulties in the way of lengthening the curriculum or of increasing the amount of study in the period which is at present allowed for the courses in tropical medicine. But it is obvious that some gain might result from a stricter choice of subject matter. The study of tropical medicine has often been referred to as a special study, but it embraces a very wide range of knowledge and in practice is constantly spreading into the realm of general medicine. To have a sound knowledge of tropical medicine presupposes as good a knowledge of general medicine. It follows that those who turn to the study of tropical medicine should do so on a basis of sound general knowledge.

The necessity of giving as much *practical* instruction as possible is obvious to us all in an institution such as this. Men can take books with them to the Tropics, but they rely on their practical training for methods. To put a cookery book in the hands of a woman who cannot distinguish between pepper and salt would be to court disaster. Instruction in general principles will make it clear that methods are not stereotyped; they are but aids to obtaining a result; they must be varied according to conditions, and new methods must be evolved to meet unexpected difficulties. That is where the untrained man breaks down; in face of a new situation he cannot go beyond his book. If he has not learned in his laboratory how methods are evolved and adapted to particular problems as they arise he is helpless and barren. He has "no root in himself."

It would be well to sound a warning to young workers as to the value of good methods and thoroughness in work, to counsel patience in research, to emphasise the wisdom of avoiding the tendency to undue haste in publication, and to ridicule the love of publicity and advertisement that has seized upon some of our brethren at home and abroad. These failings discredit not only scientific men, but science itself, for they lead to over-hasty and unwarranted generalisations and to the premature application of discoveries that are but half born. A carelessly worked-out contribution to science, even though it be but a maiden effort, often throws discredit on the good work which a man may do in after years. This damaging result is often risked in the struggle for recognition, but the penalty is sure, for it is at least as difficult to recover a reputation in science as it is in morals. If some seem inclined to deprive others of their due by loud trumpeting and "pushfulness," let us not be of them; reputations so achieved have no enduring quality. At the same time it would be well if those holding established positions did all in their power to assure just recognition of the work done by younger men. To win the praise of the masters should be the

ambition and the attainable reward of the aspirant. Finally, well-trained men, when entrusted with investigations or sent out on expeditions, should not be burdened with too many instructions from committees and the like, composed frequently of well-intentioned gentlemen at home who scarcely understand the conditions at the front. We speak of fair play in sport, let us see that there is more fair play in science.

THE TREND OF RECENT INVESTIGATION.

A survey of recent work in tropical medicine shows us that investigation is chiefly being directed to the study of protozoal diseases. No advances of fundamental importance have been made with regard to malaria since the classical investigations were published with which the names of Ross and Manson, Grassi, Bignami, and Bastianelli will ever remain associated. The earlier work has been confirmed and extended by many investigators. The prevention of malaria by means of mosquito destruction, and other measures directed against mosquitoes, has been tried in various localities, in some instances with success, in others with doubtful results. This is, however, only what might be expected in view of the diversified difficulties which must necessarily arise. Such difficulties must be met and overcome by ripening experience. There has been a veritable flood of malaria literature of recent years, including an annual volume of "Atti della Società per gli studi della malaria," the series commencing in 1900, which has come to us from Italy. Mosquitoes have received an immense amount of attention, after being much neglected in the past. The number of genera and species, and their classification, have become subjects to bewilder all but specialists.

The important discoveries on sleeping sickness, ushered in by the researches of Castellani, a pupil of this school, have been confirmed and extended by Bruce and his collaborators of the Sleeping Sickness Commission. The relation of the flies belonging to the genus *Glossina* to the transmission of the trypanosomes is being actively studied, and many important questions, we must hope, are nearing their solution in connection with this most fatal malady. A contribution has just come to hand from Gray and Tulloch with regard to the multiplication of the parasites in *Glossina*, indicating that the belief recently expressed is warranted, namely, that the parasites undergo a cycle of development within the insects. Of importance in their bearing on the question of the development of trypanosomes in other than their vertebrate hosts are the investigations of Schaudinn on *Trypanosoma noctuæ* in *Culex*, those of Brumpt on certain trypanosomes of fishes, which undergo their cycle of development in leeches, and those of Prowazeck on the rat trypanosome, which he has demonstrated undergoes development in the rat louse (*Hæmatopinus spinulosus*).

Of recent discoveries, the one which to me appears to carry the greatest weight is that of Novy and McNeal. They have been the first to obtain pure cultures of protozoa, maintaining trypanosomes of different species alive *in vitro* for many generations. There is no telling whither the methods they have given us may lead; they directly stimulated Leonard Rogers to experiments, wherein he succeeded, by an ingenious method of his own, in cultivating another protozoon, the *Leishmania*, obtained from cases of kala-azar.

The work on the tick-transmitted diseases known as the piroplasmoses (redwater, &c.), occurring in cattle, sheep, horses, and dogs, has been pursued in various parts of the world with great activity. The results appear to me to indicate, what I believe also holds for human malaria parasites, that we shall in time learn to distinguish different parasites which we at present consider to represent single species.

Toward the end of last year the presence of spirochætæ in the blood of persons suffering from "tick fever" was demonstrated by Philip Ross and Milne. The investigations of Dutton and Todd on tick fever in the Congo Free State, announced in February, afford scientific proof that this disease is transmitted by a tick (*Ornithodoros moubata*) after it has infected itself with blood containing the spirochætæ. This has been confirmed by Koch, if we may rely on what has appeared recently in German newspapers. It is, however, quite premature to assume that African tick fever and European relapsing fever are due to one and the same species of spirochæta; in fact, it is highly probable that this is not the case, although the report in question refers to the spirochætæ as one species. In relapsing fever in Europe the bed-bug (*Cimex*) has long been suspected to be a carrier of the infective agent, a probability which was considerably heightened by Karlinski's observation of motile spirochæta in the bodies of the insects up to thirty days after they had fed on relapsing fever blood. Schaudinn, moreover, informs me that he has observed the multiplication of the *Spirochæta obermeieri* in *Cimex*. These observations, following closely upon those published by Marchoux and Salimbeni, are of greatest interest and practical import. The last-named authors demonstrated that a fatal disease of the fowl in Brazil is due to a spirochæta which is transmitted through the agency of a tick (*Argas miniatus*), and this is capable of conveying the disease even six months after feeding on infected blood. These spirochætæ multiply in the tick and are present in large quantities in its body cavity throughout this period. These observations are very suggestive, since they demonstrate the long persistence of the parasites in their carriers, and render it probable that they will be found to be harboured much longer. Finally, the finding this year of *Spirochæta pallida* in syphilis by Schaudinn and others in man, and by Metschnikoff and Roux in experimentally infected apes, cannot escape a passing notice, even though the disease is unfortunately not confined to the Tropics. It is of some interest to note that the close blood relationship existing between the apes and man, demonstrated independently by means of the precipitins by Grünbaum and myself, served as a direct incentive for the experiments of Metschnikoff and Roux, Lassar, and Neisser, which proved that human syphilis is communicable to the chimpanzee and ourang-outang.

Of interest have also been the discovery this year of a number of new protozoal parasites in the blood of different animals, in addition to numerous new species of trypanosoma. I refer to new forms called "leucocytozoa," because they inhabit the white blood cor-

puscles of their vertebrate hosts. Leucocytozoa were first discovered by Bentley in dogs in India, and were described, without sufficient mention of this fact, by James. Another species has been found by A. Balfour in the rat (*M. decumanus*) in Khartoum, and, lastly, W. S. Patton informs me that he has found a species in the squirrel (*Sciurus palmarum*) in India, and apparently observed developmental forms thereof in a louse. Balfour has moreover described a new hæmogregarine occurring in the jerboa (*Jaculus jaculus*), and Graham-Smith, in our laboratory, has found another new endoglobular parasite in the mole. This by no means exhausts the "finds" of this year, but it will suffice to show that British workers are doing their share in furthering our knowledge in this regard.

Of the diseases due to Vermes I can say but little. The discovery of Catto's Schistosomum in this laboratory is familiar to you all. It is interesting to note, following on the experiments with *Ankylostoma duodenale* by Looss, proving that the embryo worm can infect by penetrating through the skin, that Boycott in London, and Tenholt in Germany, have confirmed the fact this year in two experiments conducted on medical men who volunteered for the purpose.

Again, it is apparent that the subject of immunity in relation to protozoal diseases is proving to be one of great difficulty, and the results hitherto obtained indicate that new methods will have to be devised if the problem is to be solved from a practical, and still more from a scientific, standpoint. It is also obvious in this connection that the problems before us can only be solved by animal experiment, and this accentuates the need of our giving an increased amount of attention to comparative pathology as we push on toward the alleviation of the ills to which our own flesh is heir.

Gentlemen, I must apologise for the very sketchy nature of the *résumé* which I have just given you. There are many matters left untouched, including even such important diseases as yellow fever and Malta fever, on which active work has been done. My object has been to seize upon a few salient facts with a view to showing how much has been accomplished within a short period, and how great are the opportunities for the workers in this school who are destined to labour in new fields in different parts of the world. Perhaps what I have said—in no spirit of presumption—will serve as an incentive to some of my hearers. Let me conclude with some wise words from the Talmud:—

> The day is short and the work is great. It is not incumbent upon thee to complete the work, but thou must not therefore cease from it.

THE TREATMENT OF SPRUE.

By David J. Galloway, M.D., F.R.C.P.Ed.,
Singapore.

To deal adequately with the subject of the treatment of sprue it is necessary to recognise the existence of several classes, for, although in all the pathological process is the same, the difference in site of that process gives rise to several clearly-defined clinical entities. To avoid prolixity I will deal only with the types which represent the extremes of these conditions, viz., the acute gastric type and the chronic enteric type, leaving it to be understood that between these there are many gradations.

Acute Gastric (Native) Type.

The *symptoms* are limited to the upper part of the alimentary canal. Oral, substernal, and gastric pain are complained of, and the changes in the mouth are very marked and occur early. Though in an acute exacerbation there may be diarrhœa, the rule is an obstinate constipation. Emaciation is rare, but anæmia may be very great. The latter is of the type of progressive pernicious anæmia, with a high hæmoglobin equivalent. This form of sprue is differentiated from acute gastric catarrh chiefly by this and by the oral condition.

The *treatment* of this form is simple. It is always well, even in the presence of considerable diarrhœa, to administer a full dose of calomel. As such cases are never emaciated, starvation would be the ideal treatment; and for the first twenty-four hours, longer if the patient does not object, only warm water rendered slightly alkaline with sodium bicarbonate is given; then milk diluted with an equal quantity of lime-water may be taken, and this is continued for a week. As nothing but liquids are being taken, it is not necessary at this period to use an anæsthetic paint for the tongue, but the mouth should be frequently rinsed with a 1 per cent. solution of phenol. This tends to allay pain, and certainly seems to conduce to the rehabilitation of the surfaces with epithelium. After the expiry of that time it will be found that the soreness of the mouth and the burning pain in the gullet and stomach are much diminished and that the appearance of the tongue is one of regeneration of epithelium, small particles of casein adhering as a thin film in patches, the first indication of the formation of a "fur." The diet may now be amplified, and it is well to begin with those prepared foods which are partially cooked or are pancreatised, such as Savory's or Benger's. Malted foods are not well borne, causing acidity and pain. Later the farinaceous foods, such as rice, tapioca, &c., are available, and at this stage fruits of the class of banana, water-melon, and papaya are allowed. Having now to deal with solid food, an analgesic paint for the tongue may become necessary, and a 4 per cent. solution of cocaine applied before eating adds greatly to the comfort of the patient. For a further month he must adhere to this *régime*, his only medication being 10 grains of rhubarb, with 5 of chinosol, given in a cachet every morning fasting. When he does begin to amplify his dietary, he will do well to look upon his tongue as his barometer, and any hyperæsthesia of the mouth should lead to a careful revision of the constituents of his meals. In this, as in all types of sprue, fats should be cut off. They are not absorbed, being found largely in the stools, and they are frequently the cause of a relapse. With a return to comparative health the only treatment necessary is that of the constipation, and a morning dose of one of the bitter waters meets all indications.

It is interesting to note that many natives treat an acute outbreak from its incipience by a diet of soft-boiled rice, bananas, and water, and subsequently

adhere to a vegetarian diet, and while doing so keep well.

Chronic Enteric Type.

In the chronic enteric type of sprue we have to deal with a condition which, in many respects, is diametrically opposite to the preceding. The history centres round one prominent symptom — diarrhœa, which, beginning as a morning flux many years ago, has now encroached on all the hours of the day and night. The mouth affection does not come grossly into evidence until late in the disease, but may then be very troublesome. This type occurs chiefly among Europeans, and the sufferers generally seek advice when an acute inflammatory access is superadded to the existing chronic affection, and this is the condition so well described in the classical records of sprue. In these records the treatment has been reduced to the axiom, "put the patient to bed, keep him warm, feed him on milk." The underlying idea is rest, physical and physiological, expenditure of energy reduced to a minimum, both as to the keeping up the bodily temperature and as to the tax on digestion.

After an initial purgative, and under the influence of rest, warmth and milk feeding, amelioration progresses, but it progresses slowly. The progress is as follows: the stools become less frothy, less whitewashy, and smaller in quantity; there is an increase in the amount of urine passed, and any fever which may have been present is lost. About the fifth or sixth day a distinct yellow tinge appears in the stools, which are now small in quantity and glutinous in consistence (custard stools), and flatus can be passed without the necessity of going to stool. During this week there is rarely any great diminution in the number of calls, and this is due invariably to hyperperistalsis. This was demonstrated with the exactitude of an experiment in one of my cases in whom the ingestion of even a mouthful of water was followed by peristaltic action, which, owing to the parchment-like thinness of his abdominal wall, could be traced until the offending material was expelled. The abdomen is now flat, there is little gurgling, the tongue and mouth are recovering their epithelium, as is evidenced by the thin pearly film which covers all surfaces, and pain in the mouth has usually departed, except, maybe, from some erosion not yet healed.

Such is the progress on milk alone, and while, broadly speaking, it covers all indications, an analysis of its factors may be of profit. When such a case comes for advice we have to deal with a patient exhausted partly by the drain from the bowel, partly by his inability to absorb nourishment, but chiefly by toxic absorption. His superadded symptoms, oral, substernal and rectal pain, anæmia, breathlessness, insomnia, can afford to stand over; the demand is for nourishment, and that demand is imperative. To accomplish this his alimentary canal has, as rapidly as may be, to be brought into a condition which will make absorption possible. With an intestine full of a seething fermenting mass but imperfectly removed by purgatives, rest, even in bed, is impossible, and so also is any chance of nutrition. The tendency has been to flout drug treatment, and to assume that no drug has any effect on the course of the disease, but, while adhering to the fundamental principles which have been laid down by Thin and Manson, a great deal may be done by judicious intervention to accelerate the rate of progress. The first step in that intervention is to deal effectively with the septic contents of the bowel, and the means which I have found most satisfactory is to administer calomel in the way advocated by Bouchard in enteric fever: 40 centigrammes divided into twenty doses, one of which is given every hour. It is rare, indeed, that all the doses are required. During their administration only much diluted milk is given. Relief is speedy and decided. The gurgling and even the purging diminish, the feeling of "seething" ceases, the stools become small, deeply stained, and nearly free from odour, and the globose abdomen becomes flat and flaccid. It is thus possible to obtain in a few hours a result which under milk treatment alone it would have taken as many days to secure. It is obligatory on us to maintain the intestinal asepsis thus begun, as under this line of treatment the diarrhœa ceases and the red blood corpuscles increase more rapidly than if no such treatment had been adopted.

Intestinal Antiseptics in Sprue.

There are now many reliable non-poisonous antiseptics: izal, cyllin, acetozone, iodoform, salol, beta naphthol are some of them, but the remedy I have found most useful is chinosol, given in Burroughs Wellcome & Co.'s sugar-coated "tabloids" of 5 gr. each, thrice daily at first, but reduced to twice or even once daily as progress is made. Relieved of the intoxicating process, and with the mucous membrane assuming a healthy tone, as judged by the appearance of the mouth, the quantity and quality of the milk are gradually increased until the patient's limit is reached.

Treatment by Milk.

Frequently difficulty is found in disposing of the amount of milk, 100 oz. per diem assumed to be necessary. This may be due to several causes, but the usual one is purely a question of capacity. The stomach, it must be borne in mind, is in the same condition as the mouth, swollen and inelastic, and any approach to distension is followed by pain. Under those circumstances the addition of milk somatose is indicated. Those cases in which the number and the nature of the stools remain unchanged after several days, a condition ascribed by Manson to *luxus* consumption of milk, I have not met with since the line of treatment suggested above was initiated. But there occasionally happens a case in which, after the effects of the calomel have passed off, the stools remain white (consisting of undigested milk curd), while the amount of urine passed has risen considerably. I have interpreted this condition as one in which the capability of absorption is retained, but that of milk digestion lost, and have treated it by pancreatising the milk and allowing the patient to drink quantities of whey.

When Milk Fails.

If, in spite of precautions, the condition remains unchanged, it is well to recognise that we have to deal with an idiosyncrasy, and to resort at once to the other method of feeding which is still open to us, that

by meat juice, Brand's Essence, chicken broth, &c. These should be given well diluted, slightly warmed, and slightly salt. We have to be content with very small beginnings. We do not expect an immediate increase in weight. It is enough if we are able to stop any further loss. Knowing from the appearance of the tongue, and of the dejecta, and from the increase in the number of red blood corpuscles, that organically favourable changes are taking place, we are encouraged to persevere in the milk treatment, and are enabled to repel the well-meant suggestions of friends and to assure them that any superaddition would be disastrous, for, although on the lines indicated above it is possible to add to the efficiency of the treatment, there is no reason to assume that an earlier departure than the five or six weeks can safely be made. Progress may be expedited by the daily lavage of the lower bowel by a weak solution of chinosol at blood heat. The injection is best administered at low pressure through a long tube with the patient lying on the right side with the buttocks raised. He is encouraged to retain it for a short time, and to aid him in this it is well to stop before the distention of the colon becomes uncomfortable. The condition of hyperperistalsis has been referred to. It often is found that after all flatulence, distension and gurgling have ceased and the stools become comparatively inodorous, their number remains as great as at the beginning of treatment. This is to be met by the administration of codeine in 1-grain doses. In painfully excoriated, possibly prolapsed rectum, a suppository of tannic or gallic acid with $\frac{1}{8}$ gr. morphine is indicated.

Increasing the Dietary.

After the expiry of the five weeks we may begin to add to the dietary, and the first addition is fruit. In the Tropics the fruit to begin with is banana, and of these the large "mealy" varieties are best; but apples, water-melon, papaya, cucumber, are well borne, and can be taken in quantity. Most of the home fruits are available if freed from much of their preserving sugar by washing, and this opens up a large selection —apricots, peaches, pears, strawberries, &c. The orange tribe generally are not admissible, and the same applies to pineapple. After a week or two on fruit and milk, some of the farinaceous foods may be added, then, gradually, fresh fish (boiled and without sauce), vegetables, bread, and, lastly, chicken or very lean meat. Eggs are of doubtful value, not from any doubt of their nutritional value, but from idiosyncrasy on the part of the patient. Sometimes they agree, and are a valuable addition to a limited dietary, but, when they disagree, they do so badly.

It is now eight weeks since treatment was begun, six or more since the stools became solid and daily, and the patient is now master of a sufficient dietary to enable him to proceed to a temperate climate. It is not every case which improves by the change, but the majority who do is so overwhelming that on this point we are justified in being dogmatic. To those whose interests are in the Tropics, their possible permanent relinquishment is a matter for serious deliberation, but against this is to be put the serious nature of the disease. He should clearly understand that the process is a destructive one, that already a large part of his alimentary tract is affected, and that each exacerbation means a further encroachment on a (possibly) small healthy remainder. Even with these facts clearly before them, there are not a few who deliberately elect to remain in the Tropics, and the care of these ambulatory cases is full of instructive lessons. Not the least instructive is to note the way those cases, if left to themselves, insensibly gravitate toward the dietary which I have already described as adopted by native sufferers. But a vegetarian diet in the Tropics has neither the variety nor the nutritive value which it has in the temperate zone, and something must be done to widen the dietetic horizon without increasing the tendency to relapses. To this end I have found the following rules to be of great service: a purgative should be taken every morning, preferably castor oil, though rhubarb does very well; a chinosol tabloid should be taken with a cupful of warm water half an hour before each meal. The number need never exceed three *per diem*, and, if the stools are healthy, may be reduced to two or even one. Some treatment is necessary for the anæmia, and the difficulty has been to find a preparation which would be tolerated. None of the syrupy or glycerine preparations of iron come under this category, but I have found the preparation called "alginoid iron" produce good results. Arsenic is very occasionally of service. With precautions such as these, the diet may safely include milk, all farinacea, fish, lean meat, most fruits and most vegetables, and on these a sufficiency of variety may be had to make life quite bearable, but, as already mentioned, all oleaginous matter must be rigorously excluded. Thus, greasy soups, gravies, cakes, pastry, and many puddings, are inadmissible. Our success in averting relapses will be in proportion to the strength of will of the patient and to the amount of asepsis of the bowel we have been able to obtain.

Relapses.

The first warning of an impending relapse may be either soreness of the mouth or a bout of diarrhœa, rarely both simultaneously, and it is under those especial circumstances that these curious metastases are met with—the diarrhœa suddenly ceasing and the mouth becoming sore, or the sore mouth rapidly improving on the establishment of a free intestinal flux. Overstepping the dietary limit is the invariable cause of these relapses, and no treatment beyond a return to a rigid observance of the rules already laid down is necessary.

In a fair proportion of these ambulatory cases the degree and duration of the amelioration is such as might lead one to suppose that a cure had been effected, but, in the majority, the most that can be said is that life in fair comfort may be sustained for years.

But there are limitations. Should the infiltrative process in the submucosa have affected the entire alimentary tract, there must come a time when, in spite of every care taken, every opportunity seized, we must admit to ourselves that with the contraction of the new tissue the destruction of the overlying absorptive apparatus has advanced to such an extent as to render adequate nutrition impossible. It is

during this protracted period of steadily failing strength that raw-meat juice, Somatose, Roborat, Plasmon, and any of the predigested foods which are in our repertory, find a use, and a temporary improvement may be gained; but it can, in the nature of things, be only temporary.

CEREBRO-SPINAL FEVER—SPOTTED FEVER.

By K. McGahey, L.R.C.P., L.R.C.S.,
Yola, Northern Nigeria.

During the month of February, 1905, a very serious and widespread epidemic of cerebro-spinal fever broke out in Yola, a town of 22,400 inhabitants, situated on the Benue River, and about 1,000 miles from the coast.

The epidemic in Yola province lasted from February 12th until the end of April; it spread over the greater portion of Northern Nigeria, travelling in a westerly direction, and was very largely confined to the trade routes.

The months in which it occurred are the hottest in the year, the temperature on several occasions reaching 108° F. in the shade.

The natives state that they have no recollection of any such disease ever having visited them before, but I understand that in other parts of the protectorate spotted fever has been previously recognised.

The first case to occur here was that of an Arab who had just returned from a pilgrimage to Mecca. The villages on the road through which he passed were subsequently attacked by the disease. Whether his advent had any relation to the present outbreak I am unable to say, but it certainly looked very suspicious.

The present epidemic has been no respecter of persons, rich and poor, young and old, males and females, being alike attacked, nor has its distribution been confined to any particular area of the districts visited.

In those towns attacked the disease remained active for from three to four weeks, then suddenly disappeared.

Incubation period.—One of my servants, a boy of 12 years of age, ran away and slept in an infected compound (there being two cases in the compound at the time); he developed the disease on the third day and died on the fifth day. The Residency, where the boy was living, is two miles away from the nearest infected area, and at that time the strictest isolation was being enforced, so that, as far as I know, he came into contact with no infected cases; this case would show that the incubation period was as short as three days.

Food as a source of infection.—One case, a child 3 months old, developed the disease and died; the child was breast fed, and had not received any other kind of food; its mother was healthy at the time, and did not subsequently contract the disease, so that I think in this particular case food did not act as a carrier of the disease.

The disease does not seem to be acutely infectious, I myself going freely amongst them. I knew of one case, however, where a man slept in a house in which a patient had died seven days before; this man afterwards contracted the disease, although he had not visited an infected area after having slept in the infected house.

Prodromata.—No prodromata are noticeable in the rapidly fatal cases, but in those of a more mild form epistaxis, accompanied by a violent headache and a feeling of lassitude, was observed.

Signs and Symptoms.—These were typical, with the exception of the eruption, which was rarely noticed in adults, probably owing to the difficulty of detecting it in dark-skinned races, but in the case of children it evidenced itself in the form of an herpetical eruption on the backs of the hands, wrists and fingers, back of the neck, dorsum of feet, and over the clavicles. The tongue was dry and covered with a thick, white fur. Constipation was the rule. Fever: the temperature was not of a specific kind, no definite course being followed; in the malignant cases the temperature was sometimes subnormal.

Retraction of the head and neck was present in all cases.

Kernig's sign was present in 90 per cent. of the cases examined.

Complications.—Pneumonia, bronchitis, and arthritis were observed.

Sequelæ.—Blindness, deafness, and partial paralysis.

Prognosis.—Favourable in those who survived the first four or five days; the fatal cases as a rule died in from one to three days.

Treatment.—Purgatives and opiates were administered with doubtful result.

Mortality.—3 to 5 per cent. of the total population of those towns attacked, with a death rate of 50 per cent. of the infected cases.

Rapidity of onset was a marked feature of the outbreak. To cite a case: Two men went to draw water from the river about 300 yards off; both these men suddenly became unconscious, and had to be carried back in a dying state.

Malignant cases occurred as a rule during the first week of the outbreak in a town, and the milder ones towards its close.

Isolation.—Strict isolation proved effectual at the Residency, where there is a population of about 250 inhabitants, no cases having occurred there, although the epidemic was raging all around within a radius of two to three miles.

Lumbar puncture revealed a cloudy fluid, somewhat flocculent, and occasionally blood-stained.

Blood examination.—Nothing observed.

Post mortem on a man 30 years of age, who died after five days' illness, and in whom delirium set in on the first day and persisted till the end, gave the following appearances: The membranes at the base of the brain were deeply congested, and fibrinous deposits and some purulent points were discovered beneath the dura mater in the region of the pons and cerebellum; in parts the membranes were adherent to the cortex of the brain. The spinal membranes were similarly hyperæmic, and pus was present in parts beneath the membranes. All the other organs were apparently healthy.

What struck me as a very strange coincidence was the simultaneous appearance of spotted fever in New York, Europe, and Northern Nigeria. Was the sun-spot, which was visible at that time, a predisposing factor in its production?

EPIDEMIC INFECTIOUS PNEUMONIA, PLAGUE AND INFLUENZA IN INDIA.

By Major G. H. Fink, I.M.S., M.R.C.S., L.S.A.Lond.

In the *British Medical Journal* of October 27th, 1900, there is an interesting account of "Plague and Influenza, Mixed Infection in Horses," by Dr. Hossack, the District Medical Officer of Calcutta, with a bacteriological report by Dr. J. Nield Cook, D.P.H., Health Officer of Calcutta.

This point of mixed infection in connection with pneumonia is especially interesting at the present time to those who have carefully studied and watched the course of the influenza epidemic since it first appeared in India, and who also have had the opportunity of watching an outbreak of epidemic infectious pneumonia.

In 1885-86 I was medical officer to the 14th Bengal Lancers at Loralai, South Afghanistan, and had collateral charge of a Bombay mountain battery and infantry respectively. I also had medical charge of a large number of followers and coolies who were constructing the earthworks of a fort and barracks. With the consent of the officer commanding the post and the political agent, I was permitted to open a civil dispensary for the treatment of the civil population, who soon availed themselves of European medical aid. During this term of office, I had the very exceptional opportunity of witnessing an epidemic of remittent fever of a severe type, followed by epidemic infectious pneumonia in the beginning of the winter months and spring, in a climate which was exceedingly dry with extremes of temperature. An account of this epidemic was submitted by me to the pages of that valuable and most instructive journal of Indian medical and surgical science, *The Indian Medical Gazette*, with a photograph of the whole encampment. I showed the mode of invasion; the arms of the service and others it attacked; its behaviour among them; and the probable cause, or causes of its spread; and I think I then conclusively proved the epidemic and infectious character of the pneumonia, which had a special predilection for those who looked physically the strongest, but who, in the majority of cases, were sodden with malaria, viz., the 14th Bengal Lancers, who had come from a notoriously malarial area (Meean Meer, Punjab), and who were also somewhat unfortunate in being on the right wing of the encampment close to some cultivations which were periodically irrigated. The disease also broke out among the horses of the 14th Bengal Lancers, but whether it attacked the horses or the troops first, or both together at the same time, I feel I am not in a position to fully confirm, although I am disposed to feel—for reasons I shall give hereafter—that it attacked the grass-cutters' ponies first; was then communicated to the horses of the regiment which were tethered close to the men's tents; and last of all to the men, among whom it spread in various directions. I am also disposed to feel that it played its part with greater severity among the men of this particular regiment through overcrowding and bad ventilation, owing to the fact that when winter set in they covered up the doorways of their small bell-shaped B.C. tents with waterproof sheets with the idea of shutting out the cold, although the cold was not the immediate cause of this disease.

Major Duncan, M.D., I.M.S., in an article in *The Lancet*, vol. I., for 1895, p. 193, tells us of an outbreak of this same disease among the 23rd Pioneers, who were in the Peshin Valley, and who marched thence to Umballa, Punjab, on November 25th, 1885, and from that date to April 26th, 1886, there occurred in his regiment thirty-three cases of epidemic infectious pneumonia. We were quartered in the Bori Valley in the same years as the 23rd Pioneers were in the Peshin Valley, and the former valley runs at a somewhat acute angle into the Peshin Valley towards the Zhob country. The grass-cutters of the 14th Bengal Lancers used to obtain grass for the horses from the direction of the Peshin Valley. The curious point about the outbreak in these two regiments is, that both were affected about the same time of the year; but apparently the 23rd Pioneer had their worst time after leaving the Peshin Valley and arriving in Umballa, whilst the 14th Bengal Lancers were attacked badly in the Bori Valley itself; very slightly along the line of march; and not at all on arrival in Sialkote, Punjab. It appears, therefore, that the disease germs must have been carried by the Pioneers from the Peshin Valley to Umballa. Had the regiment not moved about this time—which was a very fortunate occurrence—the outbreak might have been very much severer in the Peshin Valley. Major Duncan tells us that the sick and death-rate of that regiment for 1885 were higher than in previous years, for which, doubtless, the epidemic of infectious pneumonia was largely responsible.

It would have been somewhat interesting to have known what particular disease or diseases prevailed during their stay in the Peshin Valley; along the line of march; and at Umballa on arrival, for the year 1885, in order that the proper focus of the outbreak might be more definitely fixed.

However, I take it for granted that the Peshin Valley was the real focus whence the germs were carried, for the 14th Bengal Lancers in the neighbouring valley also suffered similarly, which is therefore strong presumptive evidence in favour of the Peshin Valley. Before entering into the subject of the outbreak of epidemic infectious pneumonia above mentioned, I would relate a rather striking circumstance in connection with the carrying or conveyance of germs which is somewhat interesting. Previous to the outbreak of pneumonia, malarial fever of a remittent type was prevalent among a large number of men and followers, and several of the officers, including myself, were also down with this disease in the summer and autumn months. It was not to be wondered at in the officers and men of

the 14th Bengal Lancers coming from Meean Meer; but others, belonging to the Bombay Presidency, were also attacked, one of them, a lieutenant in the Bombay Mountain Battery, having a temperature of 107° F. with delirium, and was invalided home to Europe, whilst I myself had a temperature of 106 F. with gastric symptoms.

In the winter, and on the march back to India, we were fairly healthy. On arrival in Sealkote and for some time after, I suffered from malarial attacks periodically; and I noticed that a favourite woollen rug which I used in the Bori Valley, and which had been covered with sand time after time, when used by me close to my body, always brought on an attack of malarial fever, until I had it thoroughly boiled and put into perchloride solution. The attacks then extended to longer intervals, though they did not disappear entirely, but became less and less severe.

Similarly, I see no reason why the germs of infectious pneumonia should not have been carried away by the 23rd Pioneers to Umballa, and when a suitable opportunity of recrudescence occurred, they became active and produced an epidemic.

When I took over medical charge of the 14th Bengal Lancers they had suffered from malaria fever and scurvy, having marched from Meean Meer to Gumbaz first, and then on to the Bori Valley in May, 1885. Being strong, powerful men of the agricultural race, known as Jâts, accustomed to plenty of good milk and vegetables in the plains of India, they suddenly found that these articles of diet were not to be procured so readily and plentifully, and they were compelled, therefore, to content themselves with their rations of flour, pulse, and "ghi" (clarified butter).

When winter set in their health had deteriorated, and they felt the cold intensely. Opium, which they were accustomed to, and which is an excellent thing in a malarious region, in moderation, proved disastrous to them as soon as their bodily health gave way and pneumonia broke out, being a contra-indication from a therapeutic point in diseases of the latter kind.

Epidemic infectious pneumonia is a disease which always seems to play a very serious part wherever it breaks out, and it appears to me, that in the case of opium eaters as, in India, it is likely to assume a still more serious character, and the symptoms become so altered in some respects, as to cause the disease to closely resemble plague, unless every care be taken to make a bacteriological examination of every patient's sputa. The North-Western Frontier of India is famous for outbreaks of this disease, and it is curious that the troops that are generally, or rather, that were generally, quartered in the Bori and other valleys came from the Punjab and Bombay Presidencies.

Would it not, therefore, be possible, that the germs of infectious epidemic pneumonia might have been distributed by followers, animals, and fomites; and in many cases have been mistaken for plague in the opium eaters, which Dr. Hossack's cases mentioned in the *British Medical Journal* as "mixed infection" would support? It is a striking coincidence that the disease should have been so bad in the Bombay Presidency and Punjab; but, if epidemic infectious pneumonia, which is almost as serious as plague, could have its symptoms somewhat defaced by occurring in opium eaters, it appears to me that there is a good deal in the theory I have now advanced, namely, that influenza, plague, and epidemic infectious pneumonia are so intimately connected that it is almost impossible to diagnose the one from the other, under suitable conditions of development in certain countries.

It is a strange fact that, after the 14th Bengal Lancers left the Bori Valley, Major L. J. Pisani, I.M.S., who was on duty in the Khojak along the same route, discovered typhus fever cases in that neighbourhood, which is also a most fatal disease and might in some cases appear to resemble plague in dark races.

Epidemic infectious pneumonia is not unknown in Europe. Dr. Bruce Low gives us a very clear account of an alarming epidemic at Rands, Northamptonshire. From December, 1890, to March, 1891, no less than 155 children and infants had been attacked by pneumonia, and 104 adults and children had suffered from a "less grave malady regarded as tonsillitis, or sore throat"; "of the graver malady" he says, "it always began with vomiting and great drowsiness, occasionally there was a convulsion; enlargement of the parotid and cervical glands was also noted" (*Lancet*, Vol. II. of 1891, p. 493). In the *Lancet* of 1891, Vol. II., page 1,357, there is also a report of the death in Vienna of the Grand Duke Heinrich from pneumonia. It spread to his room attendant, who died, and then to his aide-de-camp, Colonel Kopal, and physician, Professor Oser, who were seriously ill from it.

Contagious pneumonia is also described by Dr. Frederick H. Daly, M.D., of Hackney Downs, N.E., in the *Lancet*, Vol. II. of 1894, p. 322, where three cases —man, wife, and doctor—were attacked one after the other, and died from it.

Dr. Douglas Heath also gives an interesting account in the *British Medical Journal*, Vol. I., for 1897, p. 911, of an outbreak he observed.

My object in mentioning these cases which have occurred in Europe at a comparatively recent date, and since the influenza epidemic swept over Europe and Asia, is to show, that there is such a disease as epidemic infectious, or, contagious pneumonia, known even in Europe, and that it selects about the same season of the year for an outbreak as in the North-Western Frontier of India. It is to be noted in the smart epidemic mentioned by Dr. Bruce Low that 104 adults and children had also suffered from a "less grave malady regarded as tonsillitis, or sore throat." He also states that the graver malady always began with "vomiting and great drowsiness," and "occasionally there was a convulsion"; further, that "enlargement of the parotid and cervical glands was also noted." These are points of extreme interest in dealing with the subject of my paper.

The coincidence of the existence of influenza with plague in India is not more strange than that of epidemic infectious pneumonia with plague; and, as regards mortality in the latter two diseases, they are equally high, and bear a close connection in their symptoms. It remains, therefore, for bacteriology to point out to us the true cause of the high mortality from epidemic infectious pneumonia as compared with ordinary pneumonia or the pneumonia after influenza, and what is the real nature of the contagion in each

of these diseases. It seems to me that as closely as malarial fever and kala-azar (or, as it was formerly termed beri-beri,) are associated, so are the above-named groups of diseases in which pneumonia plays so dangerous a part when it occurs.

I would now refer to the symptoms of the three types of influenza which appeared in Europe and Asia of recent years, and swept largely over India in 1890, entering the Bijnour district in the North-Western Provinces and Oudh, where I was civil surgeon in the same year, and then becoming lost and irrecognisable, if you like to term it, although I believe it has lingered with us ever since, having struck its roots deeper into systems of the human body which offered "pabula" for its higher or graver development, going on a new career, as it were, of destructive invasion; finding new and fresh fields of conquest, until it defies detection, so vast and extensive and rapid are its movements.

I had excellent opportunities of studying and acquainting myself with the influenza epidemic of 1890 and following years, both by observation of a large number of my patients as well as personal acquaintance with the disease.

There were three distinct stages in this epidemic which produced three distinct types of the disease, these I described in an article contributed to the *Indian Medical Record*. The first type was accompanied with headache, coryza, and catarrhal symptoms; the next, with lumbar pains of the rheumatic or dengue type, accompanied by sleeplessness and great exhaustion at the termination of the attack; and, thirdly, a still graver type, when the tonsils and pharynx, together with the posterior nares, became affected, and there was cough with pain in the throat, expectoration of a thick gelatino-mucoid substance slightly rusty in colour; and, in some cases, the glands (parotid sub-maxillary) gave suspicion to an attack resembling mumps. It seemed as if all the germs in creation had been let loose from all the laboratories of the world and were settling wherever they found the best pabulum for their procreation and development. The cough in this last type was most obstinate.

In 1893, I was attacked for the third time with influenza of the third degree, if I might so call it for convenience sake, and went up to a hill station for change of air. On arrival, I learnt that several cases of diphtheria had broken out, some days previous scarcely a week had passed when the manager of the hotel where I was staying with my family, came to me in a terrible state of excitement and fear, and asked me to see his niece who was suffering from diphtheria and could not breathe. I advised him to send for the Civil surgeon, but he said there was no time, and that if he did, he would probably be a long distance away attending other patients. I then, on the understanding that it was a case of emergency alone, which he might explain to the Civil surgeon when he saw him, attended his niece, a girl of sixteen years of age, and found her suffering from exactly similar symptoms as I had experienced in the plains, and which apparently were unknown in the hills, and had given cause for alarm as diphtheria. The symptoms were in no wise as urgent as diphtheria; nor were they distressing enough to call it such, and there was no membrane present which is so characteristic of that complaint. Eucalyptus treatment; combined with salicylate of quinine internally; with hot fomentations, with belladonna and linseed poultices externally to the throat; and pil. morphiæ grain ¼ at bed-time, to be repeated if necessary; together with beef-tea, soup and milk, restored the patient to health within a few days.

In these attacks, the system appears to be most tolerant of opium and morphia in patients who suffer from severe pains or sleeplessness, which I know from personal experience. During convalescence, port wine is an excellent addition to the treatment as a stimulant, and is very necessary, in my opinion, to restore the action of the heart and circulation, which are very depressed and sluggish. When pneumonia is present opium is contra-indicated.

A few days later, my children, about two years of age, were attacked similarly. I was told that there were several other children in the hotel who had been attacked with throat troubles. I treated my children with cochineal solution, carbonate of soda, and simple syrup internally; belladonna, hot fomentations, externally; and chloral hydrate grain ss. at bedtime to be repeated if necessary in water, and they were well within ten days. It is a curious fact that just about the time this outbreak occurred in the hotel, there was an extraordinary profuse shedding of pollen from the cones of the deodar trees (pines). Every breath of air brought it down in great showers, and the children with their servants used to amuse themselves by throwing stones and sticks up against the branches overhead to create these showers of golden dust, which caused amusement amid the sneezing and coughing.

This fine pollen permeated every part of the hotel, and lay thick on the railings of the verandahs. It seems to me that this powder must have proved very irritating to the throats of the young children and infants, and, in a lesser degree, to the adults; and it struck me very much at the time as being connected with the outbreak. I do not know whether any others have observed this point in India or in Europe.

It is very likely that the influenza bacillus has a strong proclivity for the pollen of the pine tribe, and might find it suitable pabulum to live upon extra-corporeally. On the other hand, it might be a mere coincidence; but I do not see why certain disease germs should not settle in the pollen of certain plants and trees which flower periodically, like the flowering of the bamboo is considered in the East as an advent of famine. Moreover, germs of disease are so closely connected with the lower forms of vegetable and animal life, that it is a feasible explanation for periodical outbreaks of certain diseases which move in cycles.

These cases of influenza resembled the "lesser malady" described by Dr. Bruce Low. My cases of the third degree were not purely tonsillitis or sore throat, and they certainly were not diphtheritic. Nitrate of silver solution, x or grain xx to ʒ locally applied, aggravated, rather than relieved the throat, as I found in some cases in which I had tried it in the plains. The symptoms resembled tonsillitis in some respects; but there was a thick gelatino-mucoid secretion, slightly rusty, which adhered closely to the pharnynx and naso-pharyngeal region, forming a crust

at times, which, on removal, brought away with it a few drops of blood.

After the influenza epidemic had—as I supposed—spent its force in its third degree, I wrote a report on the subject of its appearance and of the gradually increasing symptoms each year, giving its types; and I then gave my opinion (judging from the past history of this disease,) that it was the precursor of some graver malady or epidemic. I am still of the opinion that it is always the precursor of something far graver, which the history of events in India since 1894-95 proves to be true; but I feel that I was mistaken in supposing that influenza had expended its force when it reached its third degree.

I do not think that the alteration of my opinion that the disease had not (as I supposed in the first instance that it had) spent its force is to be wondered at, for, on further reflection, if it be considered that a disease of this nature starting with mild symptoms, but attacking large numbers and prostrating them as it did, eventually pervades the muscular, fibrous, and osseous systems, and penetrates the glandular portions of the body, it would not be at all unreasonable to believe that it could steal a march further and spread into the lymphatic, nervous and other systems, creating troubles of a still graver character, and unfitting the human race in a multitude of ways. The graver maladies which I predicted at the end of the epidemic of influenza in its third degree, as before mentioned, are a continuation of the same epidemic with more serious or mischievous results. How these latter are produced is the point which requires investigation, and this can only be done by observing the behaviour of the poison in its various degrees from stage to stage, or from year to year. There might be scores of circumstances or influences outside the human body which are capable of advancing the development of the poison, viz., in the insect; the vegetable; or even the mineral kingdoms, which would offer suitable "pabula" for colonies of microbes or bacilli, lying in wait for their best opportunity, or season, to invade the tissues of the human body through one or other channels of entry. Atmospheric and other conditions might aid their further conveyance from host to host.

These circumstances or influences from without might be considered accidental; but does not the cyclic history of various diseases gain support through this explanation of the behaviour of diseases of an epidemic character, of the description of influenza, plague, or epidemic infectious pneumonia? We know that in India, epidemic infectious pneumonia is frequently present in the North-Western frontier and Afghanistan, and that plague is present in an endemic form in the Kumaon Hills, so it only requires an accidental circumstance or influence for the conveyance of the disease to other parts of the country to cause it to assume larger and more serious proportions by further development. Typhoid fever in Europe, and in India, are almost distinct members of the same family, behaving differently in two different climates; while even typhoid or enteric in Europe has undergone changes within the last few years by a process of evolution.

Although the influenza epidemic swept over Europe and Asia so long ago as 1890, we have evidences of its presence to this day among us in most parts of the world.

Of late years there has been a strong leaning towards the theory, that within the human body are germs of various diseases (this was pointed out some years ago by Major J. Fayrer, R.A.M.C.) which await their opportunity to develop for an attack as soon as it is to their advantage, and these opportunities occur when the health runs down and the field is not sufficiently guarded by the "phagocytes" or sentries. Doubtless a law of the Creator's for the strict observance of the laws of Health; for the preservation of our life to the best advantage; and temperance in all things which we enjoy.

If such influences exist within, there must be influences without; whereby they gain entry within, for we have in the mosquito theory for malaria one of the outside circumstances or influences which convey the malarial poison to man through the mosquito. We also know that birds and animals have the parasites of malaria; why should not these influences, then, be prevailing in a similar manner in other diseases of an epidemic character? The lowest forms of animal or vegetable life are so closely connected, and, as it were merge into one another so intimately, that in the world of animal or vegetable germs of disease, one might fully expect that the animal germ, like the insect life around us, would feed upon the vegetable, and when an accidental circumstance or chance occurs, there is a wider field offered to the animal germ to procreate and live on such pabulum as pollen before entry into the human body. Moreover, if the pollen from one flower is capable of being carried by insects to another flower, and fecundating (thus producing varieties of form and colour), why should not the same law apply to the world of lowest animal life or germs, which create diseases akin to one another in some respects, producing similar symptoms, but yet bearing finer differences in others, according to the soil they germinate in?

If we believe in the theory of the evolution of man and the origin of species, and there is such a thing as the evolution of disease, then it is reasonable to accept it through some such explanation as the above in which the lowest, or humblest plant and animal life have a share.

Epidemic influenza, although it spread rapidly in India, did not reach all parts of the country at the same time; nor did its severer types of the second or third, or any other degree that there might be, travel so rapidly. It started, as I said before, in a mild degree, with very rapid strides through Europe and Asia, and the severer types came later on at intervals of a year or more, being observed in some places, perhaps, because of more accurate observation and vigilance; but unobserved, or, probably unknown, in others. At any rate, similar types of the disease were witnessed in Europe as well as in India subsequent to its first appearance in 1890. How were these types produced?

There must have been a further development or concentration of the poison to have produced such severer symptoms; and it almost seems as if Nature were preparing the human body for resisting further attacks by strengthening the various cultures by a

gradual process; and in consonance with Darwin's theory, the survival of the fittest is upheld by natural selection.

The behaviour of the poison and its rate of travelling, is largely influenced by local, climatic and meteorological conditions, and I believe it has not quite spent its full force yet. The poison has a greater chance of developing and spreading in a thoroughly dry climate, although it can find a suitable *habitat* in a moist one; but an excessively moist climate seems to retard its further development, and does not present such highly favourable conditions for its propagation. For instance, the dry plains of the Punjab, Sind, North-Western Provinces, and South Afghanistan, are places where the poison would travel rapidly and exist. These climates are extremes as regards temperature in the hot or cold seasons respectively, and have comparatively small rainfall; but the North-Western Provinces having a larger one than any of the others. Extreme heat and extreme cold might either kill, or hold the poison or germ in abeyance for a season; but as soon as favourable opportunities occur and the germ finds suitable pabulum, there is a recrudescence of the disease; a sandy or dusty soil being more suitable for its existence than a clayey one. I know I lay myself open to severe criticism when I say this, for the question might then be naturally asked, How about moist climates such as Bombay or Calcutta, and others with a clayey soil, and yet the disease has been present? True, but it is not the soil alone which offers suitable pabulum for germs to exist; the fine dust of old records and files, which are found in Government and commercial offices, serves to keep millions of germs alive, and they only await their opportunity for a dry season and for the records and files to be moved and dusted, for when stirred up you can witness the spread of the disease.

I recently saw a slight epidemic of this nature due to the old records being moved. As to the mode in which the poison enters the glandular system and strikes its roots deeper and deeper, it seems to me that the lymphatic system is the most natural portal by which it does so, and sets up severe morbid changes of a grave or dangerous character.

Whether influenza is a precursor of something more serious, such as plague; or is a form of disease which renders the body peculiarly susceptible to attacks where the plague germ is present, is a question which is indisputable if one reads the past history of such epidemics, and observes its behaviour in those attacked in our own times. It is, moreover, capable of setting up changes of a graver character when it gets a foothold, as mentioned in Dr. Bruce Low's cases, of which I certainly witnessed similar cases in India; and from its past history and from what we are at the present time witnessing in the East, it seems to me, there is a very strong link of connection.

Then, again, pneumonia when present during an influenza epidemic is always regarded as a serious complication—in fact, very serious in the aged, the infant or young child; whilst epidemic infectious pneumonia and pneumonic plague are dangerous to a degree, and very seldom does a case recover.

Dr. Hossack's group of influenza cases, which were found on the same floor of the house as where the plague cases were originally attacked, caused him to regard them at first as genuine plague, when case No. 1 (Seurani) and No. 4 (Sewgobin) died; and although he was doubtful for a time in his own mind as to their being actual plague, he was disposed to consider that they were, because of the plague deaths and the dead rats found in the same house. At the same time cases Nos. 2 and 3 (Ram Nath's wife and Phoolbasia) having recovered, which seemed hardly possible in Phoolbasia's case had it been pneumonic plague, caused Dr. Hossack to doubt whether these four cases could be plague, and he therefore considered them as influenza, but could not get away from the feeling that they might be plague. When in doubt play trumps; hence Dr. Hossack following this rule called them all plague cases.

Dr. Nield Cook's bacteriological examination from cultures made of Seurani's and Sewgobin's tissues, and also sub-cultures on agar and broth, did not confirm Dr. Hossack's opinion of these cases as plague, but pronounced them as influenza. Dr. Nield Cook also obtained no stalactite growths after inoculating flasks of peptone bouillon with oil floating on the surface, but got only a fluffy deposit at the bottom of the flasks, and he states that he believes from the cultural and microscopical appearances that they were the bacillus of influenza described by Pfeiffer, Kitasato, and Klein.

These cases of Dr. Hossack's clearly prove the difficulty of diagnosing cases of plague from influenza, especially when pneumonia is present and the patient still living; while the same difficulty is experienced in diagnosing influenza from plague, when glandular swellings are present in the former, as was the case in the father of the family who was attacked with influenza and enlarged inguinal glands as described in the *British Medical Journal*, page 89, June 8th, 1901.

Now, as to the bacteriology of these several diseases above mentioned, Crookshank in his work on bacteriology gives us an account of the bacillus of hæmorrhagic septicæmia in various birds and animals both wild and domesticated, and there is a very close resemblance between fowl cholera, plague, and hæmorrhagic septicæmia, as far as their respective bacilli are concerned.

Then, again, if we examine the *Bacterium pneumoniæ crouposæ* and Friedlander's pneumococcus, we will observe a very striking resemblance to the bacillus of hæmorrhagic septicæmia, both in their morphological characters as well as culture in nutrient gelatine, respectively. In Sternberg's micrococcus which he found in the blood of rabbits inoculated with saliva, there will also be observed a resemblance in morphological characters to the above-mentioned bacilli and pneumococci, which Pasteur has found also in the blood of rabbits inoculated with the blood of a child suffering from rabies.

Talamon found the same organism in pneumonic sputum which Sternberg identified; Netter found it in purulent meningitis; and Monti in cerebro-spinal meningitis; Weichselbaum found it in ulcerative endocarditis; whilst others have found it in acute abscesses of the middle ear and in purulent inflammation of joints after pneumonia, which points once again to septicæmia or hæmorrhagic septicæmia.

Sternberg's micrococcus has earned various names owing to the above facts; it is known as a "microbe de saline," "*Micrococcus pasteuri*," "lancet-shaped micrococcus," "*Streptococcus lanceolatus pasteuri*," "*Diplococcus pneumoniæ*," "*Bacillus septicus sputigenus*," "micrococcus of sputum septicæmia."

Sternberg concludes that this micrococcus is the cause of acute infectious pneumonia, but is associated with widely different pathological processes, and the possibility of its being a "saprophyte," which finds in pneumonia a suitable soil for its development, ought not, therefore, to be overlooked.

Klein also found a micrococcus in pneumonia sputum which does not differ from Sternberg's micrococcus, and in cover-glass preparations resembles Friedlander's coccus surrounded by a halo without a definite capsule. Their morphological characters bear a very close resemblance, and present forms intermediate between cocci and bacilli. Poels and Nolen isolated a micrococcus resembling Friedlander's pneumococcus in infectious pleuro-pneumonia, and inoculation in cattle produced a condition considered indicative of pleuro-pneumonia.

Arloing, again, isolated a bacillus in infectious pleuro-pneumonia which produced a more marked rise in temperature in animals suffering from pleuro-pneumonia than in healthy animals, and he provisionally named the micro-organism *Pneumo-bacillus liquefaciens bovis*, *Pneumococcus guttæ cerei*, *Pneumococcus lichenoides*, and *Pneumococcus flavescens*; they are composed of short rods; non-motile and with no spare formation observed in them. They liquefy rapidly in gelatine, form on potato a white layer which becomes brownish or greenish sometimes, and, according to Arloing, pure cultures produce in the ox when injected subcutaneously, or into the lung, the same lesions which are produced by virulent lymph. Guinea-pigs and rabbits are slightly susceptible, "dogs are immune."

If we now come to the question of influenza, we shall find that the disease is also highly infectious in its character and easily communicable from one person to another; it is characterised by catarrh of the respiratory tract and the gastric mucous membrane; is accompanied with great prostration and mental depression, and ends frequently with pneumonic complication. The gastric complication might be secondary to the respiratory, insomuch as many patients swallow their expectoration from the lungs which are charged with bacilli, and it finds, perhaps, in some cases a suitable nidus for further development in the alimentary tract.

The bacillus of influenza by cultivation shows filaments composed of long and short rods, cocci forms, and irregular filaments. It has been found by Canon in the blood, and by Pfeiffer in the purulent bronchial secretion. It has been transferred to monkeys through the nasal mucous membrane and symptoms similar to influenza were produced. Equine influenza, or "pink eye," has been observed to prevail with the influenza epidemics which have spread in man; but apparently there is a want of evidence on the point of intercommunicability or relation between the two diseases. If the aforesaid circumstances can be established with regard to man and the horse in epidemic infectious pneumonia, it would contribute to show that there is a strong connection—from an infective point of view—between man and the equine tribe; and there seems to be a far greater likelihood that the communication from the horse to man is more probable, than from man to the horse; and the conditions which were favourable in this particular outbreak among the 14th Bengal Lancers, as described above, together with that among the 23rd Pioneers, would tend to point strongly to favourable conditions in those men for germ-proliferation, since the disease was not at all severe in the men of the Bombay troops, who were either immune, or, in whom the conditions or the soil, were unfavourable through want of predisposing conditions (as will be observed from the disposition of the encampment and the animals present), together with other causes most probably.

Malarial fever, or the conditions favouring it, or some other cause, might be considered highly conducive to the development of the germ of epidemic infectious pneumonia; or it might become infectious to those strongly predisposed by such causes as might lower the system, as in the case of the 14th Bengal Lancers who were strongly built men.

If we notice the behaviour of the bacilli and cocci above mentioned, in hæmorrhagic septicæmia, pneumonia and influenza, there seems a very strong chain or link of communication clearly established between the lower animals and man; and the poison is carried from the former to the latter, under certain conditions. The bacterium, bacillus or coccus of pneumonia, which has been investigated by Friedlander, Sternberg, and other most eminent investigators, has been found in so many parts and systems of the human body, setting up so many pathological conditions, that it seems to be as ubiquitous in its changes of form, character, mode of attack, and action, as the influenza bacillus, which sets up so many different trains of symptoms affecting so many portions of the human frame, that it seems to have a multitude of portals of entrance, and to become a septic poison very rapidly.

Then, there is also a very important point to consider in the matter, namely; the temperament or mood of the patient, the poison selecting its point of vantage as regards this, and also the time for attacking the subject.

The points which are most vulnerable in epidemic influenza and infectious pneumonia, are the lungs. The disease germs seem, as it were, to prefer this channel of entrance, since it is in communication with the outer atmosphere, and the germs are doubtless äerobic. Given these conditions, then, its best and safest opportunity of attacking and destroying in its most suitable *habitat* has been attained, and thereby a further infective base or laboratory of culture, from a defence as well as a distribution point of view, by dissemination through the blood, is created, when it then exhibits the greatest activity and infectivity, and makes further invasions and conquests of the tissues, and other systems. If we regard rats as the conveyors of the germs of plague, these creatures, we know, have free access to our houses and stables; and wherever grain and cereals are to be found. The rat visits the stables in India, because of "grain" or the horse's food which lies in buckets and on the floor; and if equine

influenza or "pink eye" is present, the rats might become infected with this disease, and a pneumonic form might break out in them for various reasons, because they live in the roofs of houses where the atmosphere is heated and stuffy, and contains the germs in a concentrated or highly infectious form. If they do not live in the roofs of houses, they possibly live in holes in the walls or ground which are ill-ventilated and close; and by shutting out sunlight and air, there are conditions present in the dark, damp, and hot chamber which favour rapid and highly infectious germ proliferation. These creatures wander about the house in search of food, particularly at night; and drop their insect life and droppings wherever they go, and so distribute the disease in a very virulent and highly infectious form, almost allied to plague in its high degree of infectivity. The destruction of rats when such a disease is present is perhaps a very safe measure; but then, their holes and burrows, the roofs of a thatched dwelling, which contain their vermin, also require every attention, for, if a future invasion of the house by rats occurs, the germs are present there for future proliferation and development, and it seems, therefore, very necessary that such dwellings should be treated by a powerful disinfectant of a gaseous type; and the floors by fire with a view to destroy the germs. In the case of thatched roofs in India, which are not newly thatched every year, but are merely replenished with new thatch with the old, it seems a dangerous practice to allow the thatch to remain, and so the best plan, it seems to me, is destruction by fire, or thorough disinfection for some forty-eight hours or more with a pungent and gaseous disinfectant efficiently carried out, such as sulphurous fumes (by burning a quantity of sulphur, while every opening and cranny is closed or sealed up during the process). For the destruction of rats thoroughly and efficiently, which would then entail burning the thatch of the roof, there is no surer and better rat-catcher or hunter, than a "mongoose," which should be tamed and well fed and cared for. This animal is about the most useful for hunting out rats and snakes in a house, for it can penetrate every nook and opening; is fearless; and takes the greatest delight in its pursuit.

The rat, then, might transfer a highly infective form of the disease to man, which enters the lungs and assumes a very virulent type of disease in the sense of a septicæmia, through purulent changes which might create metastatic abscesses which infect the whole system through the glandular and lymphatic channels of the body.

The gastric form of influenza might also be one of the roads through which the abdominal glands share in a mild degree at first in such changes by the channel above given, namely; swallowing infected sputa.

It is a very curious fact, that epidemic infectious pneumonia has been mistaken by some observers in its symptoms for cerebro-spinal meningitis. The fact of the bacillus or coccus of acute infectious pneumonia (as Sternberg declares the micrococcus to be); whilst Monti found it in cerebro-spinal meningitis; Netter in purulent meningitis; and others in various affections as before mentioned, points strongly to what I maintain, that there is a strong link or connection in this infection, which would be lost or unnoticed by some, unless very carefully kept in view in its various stages; but which epidemic infectious pneumonia and influenza seem to me to establish, both from the history of influenza, of pneumonia of an epidemic type and of plague, and the manner also in which various symptoms occur which cause them to be confused with other diseases. But whether influenza, epidemic infectious pneumonia or plague, the most serious and vital point of attack in the human subject is through the respiratory system, giving rise to a highly fatal and almost malignant type of pneumonia which is equally dangerous in all three; and the ultimate termination of which is usually septicæmic changes and pneumonic plague.

Natal.

Report of the Health Officer for the Year 1904.

The Health Officer for the Colony, Ernest Hill, M.R.C.S., L.R.C.P., D.P.H., in his carefully-prepared report, states that: (1) the European population of Natal numbers 101,183; (2) the total European births amounted to 31·19 per 1,000, and the total deaths to 10·89 per 1,000 living per annum; (3) A small-pox outbreak resulted in 1,238 cases and 361 lives; 23 of the fatal cases being amongst Europeans. The natives are willing to be vaccinated, but the vaccination of Europeans had been allowed to fall entirely into abeyance, and generally the application of the measure amongst natives and immigrants alike had been fitful. The colony of Natal has, as usual, suffered the consequences of neglecting vaccination. (4) Plague, which in 1903 attacked 208 persons, in 1904 attacked 18 persons only, of whom 13 died; Durban was the chief centre of the disease. (5) Enteric fever in 1903 attacked 919 persons, of whom 84 died; whilst in 1904 the number of cases amounted to only 516 with 58 deaths, a case reduction of 44 per cent. and a mortality reduction of 37 per cent. (6) Cases of dysentery and diarrhœas fell from 206 in 1903 to 164 in 1904, a reduction of 20 per cent. (7) Syphilis is spreading to a serious extent amongst the native population. (8) Infectious diseases notified amongst Europeans amounted to 1,074 against 1,184 in 1903. The principal diseases however, pneumonia and phthisis 199 cases, were included in the 1904 return, so that the fall is more pronounced than would at first appear.

"Edinburgh Medical Journal," July, 1905.

In notes on tropical diseases Marshall after stating the generally accepted idea of the relation of trypanosomiasis to sleeping sickness, refers to Plummer's objections to the theory. Plummer holds that trypanosomiasis and sleeping sickness are distinct ailments, that the organisms of each are distinctly different when grown in the same animal, and that all cases of trypanosomiasis followed by sleeping sickness are due to a double infection.

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THE

Journal of Tropical Medicine

OCTOBER 16, 1905.

THE LONDON SCHOOL OF TROPICAL MEDICINE — INAUGURAL ADDRESS AND DINNER.

DR. NUTTALL delivered his inaugural address before a large audience in the lecture theatre of the School of Tropical Medicine on Wednesday, October 11th. We print the text of his excellent address elsewhere in this issue, and we are certain that those who read Dr. Nuttall's discourse will enjoy it almost as much as the appreciative audience who listened to him. Sir A. Maloney, K.C.M.G., occupied the chair, and in the course of his remarks drew an instructive and useful picture of life in the Tropics, and stated simple and effective methods of preserving health in warm climates. His advice was temperance in all things, exercise in moderation, and the cultivation of a contented mind.

The entries at the school for this season numbered 38 at the date of the inaugural address.

SCHOOL DINNER.

Under the presidency of Sir Ralph Moor, K.C.M.G., a large assembly sat down to dinner at the Gaiety Restaurant on the evening of October 11th. The chairman's immediate right was occupied by Dr. Nuttall, the "orator" of the day, and on his left Sir Alfred Jones, K.C.M.G. Amongst others present were Mr. H. G. Read, of the Colonial Office, Sir A. Maloney, K.C.M.G., Sir Francis Lovell, C.M.G., J. M. Atkinson, Principal Medical Officer, Hong Kong. The Seamen's Hospital Society was represented by Mr. Percival A. Nairne, the Chairman of the Committee of Management, and Commander George Hodgkinson, R.N. The staff of the hospitals of the Society and the lecturers of the School were well represented, and many medical officers in the colonial service who had gone through the course of instruction at the School were present.

The Chairman, after the loyal toast, gave "The London School of Tropical Medicine and its students," coupling the name of Sir Patrick Manson, K.C.M.G., with the toast. The speakers to both the proposal and the reply dwelt upon the necessity for ample financial support being given to the Schools of Tropical Medicine. The work they were doing had received recognition and appreciation on every hand, and seeing that the foundation of a School of Tropical Medicine was no longer an experiment but a question of established success and of proved imperial necessity, the duty of the country and of the Government is to see that the work is not hampered or in any way retarded by want of the comparatively insignificant sums required.

Sir Patrick drew especial attention to the public spirited manner in which the committee of the Seamen's Hospital Society had come forward in establishing the School.

Professor Hewlett proposed "Tropical Medicine and Hygiene, coupled with the name of Professor Nuttall, the orator of the day." Professor Hewlett, after paying a just tribute to the excellence of Dr. Nuttall's address, said that, considering the number of subjects dealt with during the course now prescribed by the London School of Tropical Medicine, and the rapid accumula-

tion of new facts in connection with tropical pathology, the question of extending the course beyond its present limits would soon have to be entertained. Professor Nuttall acknowledged the compliments paid him, and in a witty speech referred to the many developments of surgical and medical tropical work.

Sir Alfred Jones, K.C.M.G., in earnest and eloquent terms, proposed the toast of "The Tropical Colonies." He impressed upon those present the close connection between the scientific aspects of dealing with disease and the necessities of commerce. Civilisation in the dark places of the world meant commerce, but commerce was impossible in places where white men cannot live. He had, therefore, seen it his duty to support the Schools of Tropical Medicine in Liverpool and London, and he was more convinced than ever as to the necessity for those schools and of the duty of the country to further their development.

Sir A. Maloney, K.C.M.G., acknowledged the toast of "The Colonies," and stated that he had found the local governments in the Colonies and the Colonial Government at home equally anxious and willing to assist the Schools of Tropical Medicine in every way; that they had already done much to help investigation of tropical diseases, and he believed it was their intention, so long as the schools continued to advance in the way they have, to still further recognise their usefulness.

Sir Francis Lowell, C.M.G., in proposing the toast of "The Chairman," referred to the good work he had accomplished in Northern Nigeria, to his reputation as an administrator and to the cordiality with which he maintained relations with those who worked with him. Sir Francis also referred to the devotion with which Sir Ralph Moor worked as honorary secretary in connection with the dinner over which Mr. Chamberlain presided a few months ago. It was largely owing to Sir Ralph Moor that the dinner was the financial success it proved to be.

Sir Ralph Moor in reply mentioned, as did all the speakers, the whole-hearted devotedness Mr. P. Michelli, the secretary, had given to the School ever since its establishment.

Announcement.

THE QUARTERLY JOURNAL OF TROPICAL VETERINARY SCIENCE.

For many years past it has been felt that there existed a distinct want for a scientific publication dealing with veterinary pathology in the Tropics.

With a view to filling this gap in veterinary literature, certain officers of the Indian Civil Veterinary Department have undertaken the publication of a quarterly periodical to be called "The Journal of Tropical Veterinary Science."

Though emanating from India, it is hoped that its sphere of utility will not be limited to that country, but that veterinary and scientific workers in the comparative field throughout the world, whose researches bear in any way on the diseases of stock, and the relationship of these diseases to the pathological conditions in man, met with in the Tropics and colonial possessions, will support the publication by their contributions.

Each number will, as far as possible, consist of original articles of scientific interest, with the exception of such pages given up to reviews and extracts from current literature as may appear to demand attention. Nothing of a personal or political nature will appear in the Journal. Amongst the subjects to be dealt with in the forthcoming numbers, for which arrangements have already been made, will be a series of articles on the Anatomy, Physiology, and Pathological conditions of the Camel and the Elephant; the intestinal and other parasites of animals; the biting Flies and the Ticks of India, together with their importance in the transmission of disease.

Number 1 will be ready on the 1st of January next.

The annual subscription, including postage, will be Rs. 12.8, or 17s. 6d.

Communications for the Editors should be addressed to them at the Lahore Veterinary College, Punjab, India. All business letters to the publishers, Messrs. Thacker, Spink & Co., Calcutta.

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Muktesar, U.P.

Lahore,
September 7th, 1905.

We have much pleasure in announcing the contemplated issue of a journal devoted to veterinary pathology in the Tropics. In this great field of scientific enquiry there is much not only to interest medical men, but a great deal it is imperative for them

to know in the light of the distinct and intimate bearing the diseases of animals bear to those of men. We wish the editors and publishers the success a journal devoted to so useful a subject so richly deserves.

THE "AL HAYAT" HOTEL SANATORIUM, NEAR HELOUAN, EGYPT.

EGYPT is year by year increasing in favour as a health resort during the winter months. This is only what has been expected and prophesied by those who know the country. Not only is the climate pleasant, but there is the charm of orientalism around one, and an atmosphere of Biblical and historic realities unique of their kind.

The latest accommodation provided for visitors is the "Al Hayat," a first-class hotel half an hour's journey south of Cairo. The hotel is in the desert on the Mokaltum Hills, 290 feet above the level of the Nile. A feature of the building is that it is heated throughout by steam, and those who were in Egypt last winter when they remember how keenly they suffered from cold owing to the absence of any means of warming the rooms in the hotels, will welcome the innovation. The climate of Egypt, at any rate during the winter, seems to have become colder of late years, and the fact that the "Al Hayat" hotel is provided with the means of providing warmth should of itself be sufficient to attract visitors, especially old people and invalids.

New Drugs.

UNITED STATES PHARMACOPŒIA, EIGHTH DECENNIAL REVISION.

Mr. Harrison Martindale, Ph.D., of Messrs. Martindale, 10, New Cavendish Street, London, W., has issued a most useful synopsis of the principal changes in the U.S. Pharmacopœia, and compared them with the British Pharmacopœia. The new edition of the U.S. Pharmacopœia is to take effect from September, 1905. No less than 117 articles are added to the new Pharmacopœia, whilst 151 articles are omitted. Several drugs and their preparation, are now standardised; these include aconite, belladonna, coca, colchicum, conium, guarana, hydrastis, hyoscyamus, ipecacuanha, pancreatin, physostigma, pilocarpin, stramonium, and the essential oils. The "heroic" medicaments have been altered in strength so as to coincide with British and other pharmacopœial formulæ. Many other alterations and additions have been made, and serum antidiphthericum and organotherapy receive due attention.

We have to thank Dr. Martindale for the great amount of time, trouble, and close study he must have devoted to the excellent synopsis which he has drawn up. The synopsis ought to be in the hands of every practitioner in the East and West Indies, as travellers taking medicines from U.S. prescriptions are plentiful, and insist upon the drugs being made according to U.S. requirements. The pamphlet is published by H. K. Lewis, 136, Gower Street, London, W.C., and costs 2s. 1d., post free.

Messrs. Hooper, Struve and Co., 7, Pall Mall East, London, send us notice of two preparations which should prove especially valuable to travellers and residents in warm countries. "Aromatic Pyrethrum" is a liquid preparation capable of being sprinkled and sprayed about a room, and serves as a prophylactic against mosquitoes and other insect bites. "Alkcolloid" is intended as an application to relieve the pain and prevent subsequent danger from mosquito bites, wasp stings, and the bites or stings of other insects.

THE CYLLIN PASTILLE.—Jeyes' Sanitary Compounds Company, Ltd., 64, Cannon Street, London, E.C., have just introduced a Cyllin Pastille which is certain to become popular. Each pastille contains one-tenth minim of pure cyllin associated with liquorice and balsam of tolu. The quantity of cyllin present is in our opinion sufficient to prove efficiently bactericidal when the pastille is slowly dissolved in the mouth; the pastilles are at the same time agreeable to the taste and soothing to the mucous surfaces. The pastilles are put up in metal boxes each containing two ounces, at the cost of two shillings.

The Apollinaris Water Company, 4, Stratford Place, Oxford Street, London, W., are issuing large stone bottles of Apollinaris Water, containing nearly a quart of water. Suitable patent corks are sold by the Company at one shilling each, by the use of which a great economy is effected. The cost of the large stone bottles is 25s. per case of 50, or small stone bottles of the same number at 20s.

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3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the JOURNAL OF TROPICAL MEDICINE should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communications.

FURTHER NOTE ON A FORM OF MALARIAL PARASITE FOUND IN AND AROUND JERUSALEM.

By J. Cropper, M.A., M.D., B.C.
Ramallah, Palestine.

On consideration I feel that a better title would be "Further note on certain bodies found in the blood of certain cases presumably malarial" (N.B., the mononuclear count as shown later is absolutely characteristic).

On analysing the notes of my first 500 cases in which a positive examination of the blood was made, I have arrived at the following result, which is very different to that which I expected, or in fact desired at the outset. No less than 343, or 68 per cent., were cases of pure infection with the above (double infections are excluded); 162 were in children under five years, and 48 under one year.

Excluding cases from the city of Jerusalem itself, only one case under five years was found to have tertian, quartan, or subtertian parasites in the blood, and in this case the mother of the child has been long under treatment for recurrent attacks of quartan fever in which parasites can always be found.

The full importance of the above being grasped, it is plain that making all allowance for possible error, endemic malaria of the ordinary type is practically unknown under five years in this village of 5,000 people and the district around, and yet enlarged spleen, advanced anæmia with most typical differential leucocyte count (always over 20 per cent. in apyrexia) is very common, and many children have been observed for months on end.[1]

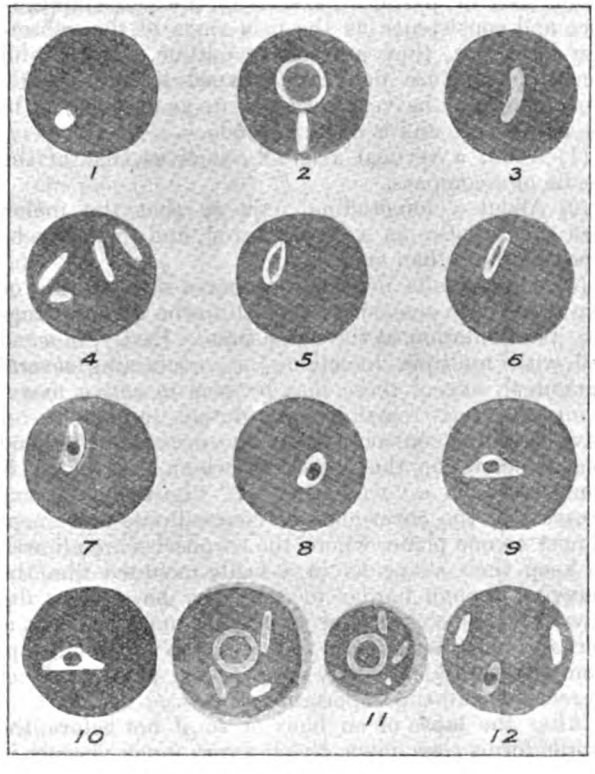
Turning to the record of cases from Jerusalem, I find that among a much smaller number examined, four children under one year, from 2½ months upwards, have been found to show the tertian parasite. It might be possible to raise the objection to this that these cases had already had quinine, but this is absurd, for quinine is much more easily obtained in the city, is rarely given free in the country, and is quite unobtainable in most of the villages from which these children come.

Illness Resembles Ponos.

There can be no question of "chronic" malaria in the children (48 in number) under one year old, and a child 20 days old has hardly time to develop into a "chronic febricitant." This is the youngest patient seen so far, but the spleen was considerably enlarged, there were motile forms in the blood, with characteristic large mononuclear count, and death on the twenty-second day. Syphilis in this case could be absolutely excluded; rickets in a marked form is rare in the country districts, and I have seldom seen congenital syphilis here, the disease being comparatively rare in adults. I do not here refer to the city. A mere catalogue of the symptoms exactly agrees with that of those found in Ponos, a disease of children, found in certain Greek islands (Spezzia and Hydra), where malaria is said to be absent.

Syrian Fever.

So far as I have been able to ascertain, medical men practising in this country have been long of the opinion that there is (chiefly, of course, from clinical evidence) a fever sometimes called Syrian fever, very resistant to quinine, but in the end amenable to it, especially prevalent among children, causing splenic enlargement, and often great debility, extreme anæmia, and at times death; this I believe to be due almost entirely to the form I have described. I have not yet found a case of tertian, quartan, or subtertian malarial fever that did not yield within a few days to adequate doses of quinine, and this appears



Figs. 1–4. Non-motile forms.
,, 5—8. The same parasite [motile] drawn at intervals.
,, 9—10. Showing similar stages, but 10 stained deeper.
,, 11 (double figure). Non-motile and showing "Brassy" body.
,, 12. Smallest form of "eye" form.

to be the experience of the Italians, Marchiafava, and Bignami, and of Dr. Osler ("Practice of Medicine"); but in this country I have seen many cases of malaria in hospital and out of it, in which this could not be said. The only reason why quinine has not been made more extensive use of is, that not being constantly on the spot, it was not possible in all cases to do so.

In the absence of definite staining reaction, it behoves us to be careful of dogmatic statements, but I have examined many cases of enteric fever, simple

[1] It is to be distinctly understood that this form is common enough in Jerusalem itself, as well as the classical forms.

anæmia, and other diseases too numerous to mention, as well as of persons in good health, and in none of these where a history of malaria could be reasonably excluded have I ever been able to find any of the forms which are so common otherwise.

Furthermore, most cases of tertian and quartan fever are quite free of such forms, even when the infection is severe, and this fact I am constantly verifying: the condition, too, is not one of poikilocytosis, which may, of course, be present in casse of cachexia.

Note on Motile Forms.—In over 50 cases I have now carefully observed these: they are by no means always seen, and rarely in cases where fever is about or after quinine has been given.

On further study of the subject I find that in the freshly drawn blood these, especially in warm weather, are in every particular, except their shape, which is melon seed or pyriform, exactly of the same appearance and consistence as the pale rings of the subtertian form, *i.e.*, they are soft in outline, need careful focussing, and are delicately shaped in the centre. Movement may be very active, quite as much so as in the subtertian, and is of three kinds:—

(1) About a vertical axis, *i.e.*, such as that of the needle of a compass.

(2) About a longitudinal axis so that the melon seed may appear as a straight rod, and this may be repeated more than once.

(3) The parasite may in the course of a minute or two move from one side of the cell to the other, changing its orientation at the same time. Lastly, in a red cell with multiple infection (*i.e.*, containing several parasites), one of these may be seen in active movement, the rest remaining absolutely motionless. I have seen this on more than one occasion. A good deal depends on the degree to which the blood is compressed, in a "well-mounted" film the necessary pressure of the cover-glass of course limits movement almost to one plane, where the corpuscles are allowed to keep their shape, as in a badly mounted film the parasite, though harder to see, may be seen to dip down into the corpuscular substance and movement is perhaps more active. In any case, the above description will readily allow any one working at the subject to recognise all the important features.

After the lapse of an hour or so, if not before, the motile forms slow down, become very much sharper in outline, blunter at the ends and somewhat smaller, in fact, forming what Sir Patrick Manson calls the "eye" forms, from their resemblance to the eye of Egyptian hieroglyphics, the pupil of the eye being represented by a very definite dot of hæmoglobin.

I have shown the above to seven or eight medical men, most of whom were quite familiar with malarial blood, and to others, none of whom had any difficulty in making out the movement described as perfectly definite and never before seen by them.

As already mentioned in most infections with tertian, quartan and subtertian parasites, this form is not seen, though cases of double infection, of course, are seen; the same is even more true of enteric fever, in the blood of which I have only once seen this form. I have also seen it in a case of phthisis.

Differential Leucocyte Count.—I have made this in over 15 cases, but, as still more remains to be done in this direction, I will only say that in well-marked cases during apyrexia the count works out in the most typical way possible. I have not depended on a count of less than 500-600, and in some cases 1,000. In a child of 20 days old, so numerous were the large mononuclears that they seemed to have changed place with the polymorphonuclears: in no other case has the percentage reached such a high figure as 70 per cent.

I have also made the leucocyte count in cases of ascaris and tænia, to see if they could be readily diagnosed by eosinophilia, but my experience leads me to believe that unless present in extraordinary numbers the eosinophiles are only very slightly increased, if at all, say to 4 per cent. As in other hot countries, the above are of course common enough. No doubt sometimes ascaris gives rise to definite febrile attacks, but in many cases I have given santonin without any lowering of the temperature, even when worms have been passed. Quinine was withheld purposely, but the fever yielded to adequate doses. In any case, breast-fed infants of a few months old rarely harbour these parasites.

Geographical Distribution.—Since my last "note" I have ascertained that this form is also readily found in Gaza, 40 miles south of Jaffa, in cases untreated by quinine, in whose blood neither tertian, quartan, nor subtertian parasites could be found in fresh or stained films. One of these was a boy who had for long been an in-patient at the hospital there for another ailment. I certainly saw the form at Banias, in the extreme north, in 1900, so that it is widely distributed in this country, and very likely far beyond it—a matter for future research. The majority of the villages from which I have patients lie at an altitude of 2,000 to 3,000 feet above sea-level, and judging by that of Jerusalem have probably an annual mean temperature of 60° to 65° F.

Seasonal Variation.—Though more abundant in the autumn, this form seems almost equally common in the winter and spring months, when the classical forms of malaria are very seldom seen in this country.

Pigmented Leucocytes.—In five or six cases these are noted. I should not regard this of much importance, apart from the fact that the most striking case of which I have notes, a child of 11 months, frequently under observation and living close at hand, showed, the day after the temperature had risen to 105·6°, very numerous and well-marked pigmented leucocytes: the spleen is still enlarged, and he has lately had another attack.

I attach great importance to the systematic and, if possible, periodical examination of the blood, and to carefully watching the action of quinine. One such case is worth a hundred patients examined on only one occasion, especially where one can control the treatment and observe its effect.

Reasons for regarding this Parasite as Malarial.—Neither the type of fever, which varies greatly, nor the presence of pigmented leucocytes is sufficient to establish this point, nor is the splenomegaly. In the present state of our knowledge the characteristic differential leucocyte count must remain as the most satisfactory evidence which we possess. As I have shown above, one could hardly wish this count to be more marked.

Addendum.—Since writing the above I have had the advantage of the help of a medical friend (at his own request I do not quote his name), who has had considerable experience in blood work, and is perfectly familiar with modern methods, to whom I have been able to show several children of 6 months' old and upwards, all having the characteristic aspect, splenic enlargement, and the above form in abundance. In one case the count of red cells was 1,200,000 per count, and the differential leucocyte count 30 per cent. of large mononuclears. The fever was typical.

In one of these cases he was able with ease to observe the characteristic movement I have described, as something certainly not seen in ordinary blood, and not hitherto seen by him.

Ramallah, Jerusalem,
September 16th, 1905.

Dear Sir,—Just a line to say that we have been favoured with a visit from Professor A. Macalister, of Cambridge, who has been kind enough to examine my slides and to check my cases. He observed movement in one well-marked case in which I had recorded the same six months ago. He offered (unasked) to sign a brief statement of his remarks, which I dotted down at the time, and he particularly endorsed the " compass."

(1) Needle movement through 45°.

(2) Greater refractibility of one end, which end moves more than the other.

(3) The movement in a plane at right angles to that of the slide, so that the parasite dips down into the corpuscular substance.

(4) The movement is not amœboid; the edges of the parasite remain " hard and firm."

He also, said " Movement is perfectly satisfactory. I have not the least doubt about it."

He also agreed that the numerous rods I showed him were in no sense vacuoles or artifacts, but genuine bodies, the slides being free from dirt or vacuoles of any kind.

The friend mentioned in my last paper has seen movement on seven occasions. If you know Professor Greenfield, of Edinburgh, he will tell you of his (J. Craw's) abilities; but I think Professor Macalister's name is of sufficient weight.

Yours, &c.,
J. CROPPER.

CANCER IN THE GILBERT ISLANDS.

By ALEXANDER ROBERTSON, M.B., C.M.

Medical Officer Gilbert and Ellice Islands Protectorate.

IN connection with the reference in the Editorial of March 1st of the JOURNAL OF TROPICAL MEDICINE to the statements of several observers of the scarcity of cancer in the Pacific Islands, I append notes of three cases of malignant disease which have occurred in my practice at Tarawa since my appointment to Medical Officer to the Protectorate in February of this year.

Neitekaton, female, 34, married, no children, Tarawa, Gilbert Islands. Admitted on account of tumour of right breast of fifteen months' duration.

Inspection shows retraction of right nipple and a puckering of the skin 1½ ins. above and to the axillary side of nipple.

On palpation a hard tumour about the size of a cricket ball is detected; it is freely movable on the pectoral muscle, but adherent to the skin at the pucker above mentioned. There is also a mass of enlarged glands under the border of the pectoralis major.

Under chloroform the breast, axillary glands and the fascia covering the pectoralis major and the upper third of the external oblique muscle were removed.

The wound healed by first intention and the patient was walking about in a week. Microscopic section of the tumour showed a typical scirrhous cancer of the breast.

As far as can be ascertained, there is no tendency to malignant disease among her relations.

Neiatuata, female, 28, married, two children, Tarawa, Gilbert Islands.

Admitted on account of tumour of abdomen of two years' duration.

Patient is emaciated and anæmic.

On palpation a hard nodular mass, 4 ins. by 3 ins., is felt in the left iliac region; it is firmly adherent to the pelvis, and is apparently continuous with the uterus.

Under chloroform a vaginal examination was made. There was ulceration of the anterior and posterior walls of the vagina. Blood and pus issued from both urethral and anal orifices. The cervix uteri was replaced by a large fungating mass, the so-called cauliflower excrescence. The uterus was enlarged and fixed, and the left broad ligament infiltrated with a hard mass; the right broad ligament to a less extent. The mesenteric and sacral glands were enlarged, masses of enlarged glands were felt in the omentum.

As the case was obviously hopeless, no operative procedure was attempted, and palliative measures, *e.g.*, antiseptic douching and a sedative mixture, prescribed.

Terrigemau, male, 55, Tarawa, Gilbert Islands.

Admitted on account of ulceration of lower lip and left cheek.

Examination shows extensive ulceration of lower lip, commencing from a point slightly to the left of the middle line and extending to the angle of the mouth. The buccal mucous membrane is also affected, and the left side of the tongue which is indented by the edges of carious teeth. There is slight enlargement of the left submaxillary gland. The discharge from the ulcer is very offensive. The subjacent tissues are indurated.

Patient states that the disease began as a small sore on his lip about two years ago. He is a constant smoker, and uses a pipe with a broken stem about 1½ ins. long. As there was a possibility of the disease being of a syphilitic character, he was put on large doses of hydrarg. perchlor. and pot. iod. for two months, but no improvement whatever resulted. He would not consent to any operative interference beyond the extraction of the carious teeth. I have since heard that the disease has

advanced rapidly, the cervical glands being now involved.

The population of Tarawa is 2,800. Whether malignant disease is prevalent or not in the other islands of the group I am unable to say, as at present I am without any facilities for visiting them. I hope, however, as soon as the medical department is provided with a vessel, to furnish information on the subject.

Since writing the above another case of carcinoma uteri has been admitted into Tarawa hospital.

Neikotanei, female, 40, married, Tarawa. Admitted on account of bleeding from vagina.

History.—For the last 18 months there has been pain in the uterus and discharge of blood, which of late has increased in amount. There has been loss of flesh for the last year.

Present state.—Patient is emaciated. Heart and lungs normal.

Abdomen.—Palpation shows a hard irregular mass in uterine region. The pelvic glands are enlarged.

Examination under chloroform.

There is an offensive bloody discharge from vagina, the anterior surface of which is ulcerated. The cervix uteri is enlarged and irregular in shape, the cervical tissue being very friable, tearing and bleeding freely when the Volsellum forceps are applied. The uterus is enlarged, nodular and fixed. Both broad ligaments are infiltrated. Portions of the cervical tissue were removed for microscopic examination, and the vagina packed with iodoform gauze.

Section of tissue showed carcinoma uteri.

At a recent visit of H.M.S. *Torch*, Staff-Surgeon Eames gave me permission to mention two cases of malignant disease he had seen lately in the Pacific Islands, viz., a case of epithelioma of the lip in Ocean Island, and one of carcinoma of the breast in the Union Islands.

A CASE OF TERTIARY SYPHILIS OBSCURED BY TYPHOID SEQUELÆ.

By William Hartigan, M.D., D.P.H.

In old days a very virulent type of syphilis was prevalent in Japan, rupial ulceration, gangrenous sloughing and nerve implication being by no means uncommon. The disease is still widespread, but the form is milder, though still dangerous (one of the worst cases I have seen, which eventually proved fatal, resulted from the insane fashion of "tatooing"); that it is also an insidious foe the following case illustrates.

A European male resident of Japan, aged 25, consulted me in June last. He had typhoid of a moderately severe type in September, 1897; recovery was slow and unsatisfactory. In December periostitis of right tibia, with phlebitis of the right saphena, supervened. The general health being indifferent, patient was advised to return to England. He there consulted an eminent tropical specialist, who found nothing radically wrong, and prescribed tonics, with some outward application for the leg.

On returning to Japan in 1898 the general health continued fair, but the tibia was still troublesome, eventually requiring operation on again coming home in May, 1900. Some necrosed bone was then removed by a well-known Manchester surgeon, the disease being pronounced a sequela of typhoid.

Patient went back to Japan and there suffered from phlebitis, was rather "nervous" with hysterical and choreic symptoms, constantly complained of bone-ache in chest, ribs and right arm, followed by ulceration, and culminating in necrosis of the junction of the manubrium and ribs, requiring operation, which was done in Tokio in 1904. An examination of blood and detritus was made, and the disease again assigned to the preceding typhoid. Whether simply Widal's reaction was present or a cultivation of typhoid bacilli made, I am unable to say, but the diagnosis was most emphatic.

The health still continued unsatisfactory and the ostitis progressed. In March, 1905, the right scapula near the acromion and the seventh rib required scraping, whilst six weeks later a portion of the ninth rib was excised, followed by removal of the appendix.

The patient has now the appearance of "the subject for an operative surgery examination," having seven operation scars on his body.

Being rather sceptical about the typhoid theory, I made firm pressure on the centre of the manubrium, well away from the site of operation, and caused considerable pain. Remembering the late Professor Tyrrell's (of Dublin) dictum "that such tenderness was almost positive evidence of syphilis or aneurism," my examination was directed accordingly.

There were no signs of aneurism; heart, lungs, liver, kidneys, all normal.

The patient had no recollection of having had any genital trouble, sores, or running, but acknowledged that he might have been exposed to infection in 1898 and 1899.

The throat was slightly injected; on the right tonsil was a scar, which might have been due to a serpiginous ulcer. When questioned patient recollected that he had some throat irritation, lasting for some weeks, about 1899, but he "did not bother about it."

He was positive there had been no rash since that of typhoid, which was general; the hair had not fallen out, but the growth was very poor.

There was considerable tenderness over the bones on which operations had been done, as well as over the upper two-thirds of the left ulna.

The testicles were small, rather hard, sensation absent.

The knee-jerk was exaggerated, other reflexes normal. There was much unsteadiness in walking and turning with the eyes shut, an inclination to drag the right toes and trip over uneven surfaces.

There has been considerable loss of weight, with a feeling of "slackness" and "not being up to much." Pulse 80, medium tension; temperature 99°; urine normal.

After consultation with Mr. Cantlie, we decided to try iodide of potassium in doses rapidly increased to 30 grs. *t.d.*, together with hydrarg. iod., gr. $\frac{1}{16}$.

The result was most satisfactory, though the patient was much alarmed by the almost immediate appearance of another very painful node on the sixth rib, which, however, quite disappeared in a month: the manubrium had then become much less tender, the ulna not painful at all.

The testicles were larger, softer and much more sensitive. On July 29th, symptoms of iodism being present, I substituted drachm doses, increased in three days to half-ounce doses (equal to 3½ gr. iodine) of syrup. hydriodic acid, which was well borne and quite as effective as the iodide.

By the middle of September everything was quite normal, patient looked in robust health, had gained more than a stone in weight, and said that "he had not felt as he did now for years."

The blood was tested in July for Widal's reaction with negative results, it was otherwise normal, with perhaps slight leucocytosis, but a blood count was not made.

The case is of interest, showing how an originally correct diagnosis led up to a wrong one, previous convictions obscuring the rather incomplete evidence of indefinite symptoms. The tibial necrosis, dating as it did from 1897, was almost certainly a sequela of typhoid; no "connection" having then taken place, specific disease is practically excluded. The later bone affections, particularly in the absence of any manifest indication of syphilis, were naturally assigned to the same cause. Their complete disappearance (having lasted for six years), which followed on a four months' anti-syphilitic treatment, almost certainly proves that their origin was specific. I had thought that Schaudinn's late discovery of the "*Spirochaete pallida* of syphilis" would have assisted in the diagnosis of such obscure cases, but Professor Mittall informs me it is not found in tertiary lesions.

Another point is the apparent absence of any sore. Any one with tropical experience knows what a frequent occurrence this is; probably because so many suffer from "dhobie itch" and "prickly heat," a slight ulcer or abrasion passes unnoticed. There is also the greatest difficulty in distinguishing *per se* between an infective and non-infective sore, for in the East "hard" and "soft" chancre, as we at home understand the expression, is quite a misnomer.

The syrup of hydriodic acid, much used in Canada and the States, deserves to be better known here.

In this case, by its use I was enabled to continue treatment with full doses at a critical stage, when the exhibition of the iodides of potassium or sodium would have had to be stopped altogether, or the dose greatly reduced.

NOTES FROM ANGOLA.

By F. C. Wellman, M.D.

Corresp. Memb. Am. Soc. Trop. Med., late M.O. Bihé Dist., Portuguese West Africa.

Prefatory Note.

The *raison d'etre* of these notes is twofold: (1) In the whole of this colony there is not a single observer (at least no English-speaking one) except the writer; (2) in the large district inhabited by the Umbundo-speaking Bantus, known as the Angola Highlands, there obtain, as the writer has shown, somewhat peculiar disease conditions due to these highlands being climatically (if metaphor be allowed) a lofty, cool, dry island, surrounded by a sea of tropical heat and moisture. The large number of new species, subspecies, and varieties, which have turned up in the writer's collection, of parasitic and otherwise noxious animals is therefore not a cause for surprise, and may eventually throw light on some aspects of the characteristic disease incidence. In the interests of tropical medicine and the geographical distribution of disease it would seem that such a region should not remain entirely unnoticed, and the following observations, dealing chiefly with this highland portion of the colony, are therefore published.

Note I.—On the Mosquitoes of Bihé.

Following are some of the common highland mosquitoes collected, with one exception, by the writer. Very brief remarks on their bionomics are added.

Anophelinæ.

Anopheles wellcomei, Theob. Sylvan, bold, bites both by day and night.

Myzomyia funesta, Giles. Breeds in clear water. Principal carrier of malaria in the district.

Pyretophorus austeni, Theob. (*sp. nov.*). Breeds in muddy pools. Domestic, but shy.

Myzorhynchus umbrosus, Theob. Sylvan.

Cellia pharœnsis, Theob. Nov.-Feb.

Cellia squamosa, Theob. Nov.-Mar.

Culicinæ.

Danielsia wellmani, Theob. (*sp. nov.*). Dec.-Mar.

Culex viridis, Theob. "Garden" mosquito.

Culex tæniorhynchoides, Giles (*sp. nov.*) Swamps.

Mansonia africana, Theob. Native kraals.

Note II.—"Owambe" (Climatic Buboes).

This common disease corresponds in most of its features to the descriptions of climatic buboes. I shall not here attempt to discuss its bacterial relation to plague. The following statements concerning its clinical features are made after having examined over one hundred cases.

(1) In about 70 per cent. of the cases some small injury to the foot, leg, or thigh of the affected side, or of the genitals, can be discovered or elicited from the history.

(2) In light-coloured natives the line of infection through the lymphatics may often be discerned in its course from the point where the epidermis is broken to the gland.

(3) Only a small fraction of the cases (less than 2 per cent.) go on to suppuration, even if untreated.

(4) Cultures from the pus of two cases both showed staphylcocci, but nothing resembling *B. pestis*.

Note III.—Report of an Epidemic of "Katumbu" (? "Pertussis").

This epidemic swept during the past eight months over a large portion of Bihé, Bailundo, and Andulo districts. Small children were usually affected, although youths and even adults were occasionally attacked. The symptoms were similar to those of whooping-cough at home. Many weakly children were carried off by it, some succumbing to simple exhaustion and others to intercurrent malarial attacks.

NOTE IV.—SOME THOUGHTS ON GOITRE.

Goitre is another of the common complaints in the district. Three facts concerning it seem to be obvious :

(1) It is confined to the highlands.

(2) It is, generally speaking, a woman's disease.

(3) It is very rarely exophthalmic (I have seen but one instance) or accompanied by other serious symptoms. I have sometimes seen cretinism (I have down in my notes one woman with an immense goitre, all of whose five children were cretins), but never any other form of myxœdema. Various theories may be held to account for its onset. Some of these are :—

(*a*) That it comes by worry, fits of anger, crying, jealously, &c. *This is the native notion also.*

(*b*) That it is due to malaria. This is exploded by the fact that in the surrounding lowlands, where malaria is much severer, goitre is unknown.

(*c*) That it is caused by residence on calcareous soil (the drinking water theory). This is certainly not the cause here, as there is no calcareous soil upon which to reside. Kaolin, however, is very widely distributed throughout the region, and may be found in most streams.

(*d*) That it is caused by the altitude and climbing.

(*e*) That it is due to carrying on the head. If this were the only cause it would be commoner among men than women, as the men are the travellers and carriers of heavy loads.

(*f*) That it comes through living near large streams.

(*g*) That it is caused by stooping at work.

(*h*) That it is brought about by female weaknesses. None of these last theories account for its absence from the lowland tribes with similar habits. The last reason can hardly be reconciled with its occurrence in men too. I am informed that the Angoni people in the highlands of East Africa, who resemble the Umbundos in many ways, are also very subject to goitre.

NOTE V.—SLEEPING SICKNESS IN ANGOLA.

In the interior of Central and Southern Angola there is a distinct line of demarcation between the sleeping sickness districts and the regions free from that scourge. This line is the Coanza River. From the north bank of the Coanza to the northern boundary of the colony sleeping sickness is endemic in many situations; while from the south bank to German South-west Africa it is not endemic, and, although one meets with occasional cases imported from the north, the disease does not spread nor attack the southern tribes. It is of great interest to note in this connection that north of the Coanza River the ordinary *Glossina palpalis*, Rob.-Des., is (so I am informed) the common tsetse-fly, while south of the Coanza the typical *G. palpalis* is not found, but its place is taken by a new subspecies (*G. palpalis wellmani*) recently described by Mr. Austen, which evidently is not a distributor of sleeping sickness. The exact relation between the geographical distribution of the disease and that of the two flies is a problem upon which I am at work.

NOTE VI.—THE AFRICAN POISON TEST.

As I have recently run across a case of such poisoning which resulted in death, I here outline the *modus operandi* of this extraordinary custom. The agents which are generally used in this region are obtained from two *Leguminosæ, i.e.*, bark of the Ombambu tree (*Erythrophlæum guinense*) and leaves of a bush called Okaiembe (*Jephrosi vogelu*), together with the rootlets of another bush belonging to the *Polygalaceæ* called by the natives Utata (*Securidaca longipeduncula*). All three are powerful poisons. These substances are dried, powdered with various others, placed in the bottom of a small gourd and carefully covered with the resinous exudation from the Ulemba tree (*Ficus psilopoga*). On top of this is poured an evil-smelling mixture of different harmless solutions. Over the surface of the liquid is sprinkled a light-coloured powder. The witch doctor, with many mystic incantations and flourishes, stirs the mess a couple of times with his finger, taking care not to touch the bottom. Then the fortunate party whom it is proposed to acquit drinks. The mixture is again stirred, scratching the resin at the bottom, and liberating the poisonous substances. After a few minutes of ceremonies and rites to gain time for the poison to thoroughly permeate the whole, the draught is once more stirred and the victim (who is always made to drink last) quaffs to his doom. Another method, similar in principle, is to have a skin bag with two compartments, one containing the poisonous powdered substances and the other an innocuous powder of the same colour, sprinkling these in turn over the top of an inert decoction.

Bailundo, Angola, August 15th, 1905.

SMALL-POX INOCULATION IN INDIA.

By Major G. H. FINK, I.M.S., M.R.C.S., L.S.A.(Lond.).

IT might be of some interest to learn the reasons why inoculation for small-pox prevails in a great many portions of India, particularly in Assam, Orissa and Chota-Nagpore in the Central Provinces, and the arguments for and against the practice. But the machinery for the eradication of this recognised evil is simple enough, if the wheels be allowed to move in the proper direction with the assistance of the authorities, in the light of our knowledge since the days of Jenner.

Small-pox is a disease which has existed from very remote times in India, and spreads from it to the West, creating great havoc in its onward march, if unchecked, in the case of great epidemics. We can understand why the Hindoos made their great offerings to "Mata Devi" (the goddess of Small-pox), and how, when they found through centuries of experience, that persons who became pitted with small-pox were protected from further invasion from that disease for a lifetime, that Mata Devi's gift was prized as the road to salvation from so terrible a scourge; and people thus courted an attack, and in seasons of mild epidemics, or, in sporadic cases took the virus and preserved it for their friends and others who were willing to be inoculated. By this practice, so heavy a mortality as in previous bad years, was, in a manner, kept off, and "Mata Devi"

came to be worshipped for her supposed act of mercy to mankind by attenuating the poison year by year. The disfigurement of the pitting was of no consequence so long as life was preserved; hence a person was looked upon with a feeling of envy, pride and admiration, rather than otherwise, for having the gifts of the goddess visible in the face or body, as a victor from the fight against this horrible disease. German students to-day are as proud of their scars in duels.

The same feeling of pride or admiration is now present, if you take a child with the marks of vaccination on its arms before those who are believers in vaccination (which has come to us by accidental discovery) either in the East or in the West; and, instead of "Mata Devi" being worshipped, the sons of Æsculapius and followers of Jenner are held in esteem, except by the anti-vaccinationists.

I will endeavour to show some of the reasons for immunity from small-pox; of mildness of attacks; and of virulence respectively, which become manifest in certain places from year to year; and this I would desire to do since one of the worthy secretaries of this section, in the *Lancet* of July 1st, 1905, p. 34, has asked the following questions:—

"(i.) Why is it that for years diseases such as plague, cholera and influenza may either remain latent or confined to their endemic centres, and then, bursting their bonds, spread over the world in a pandemic wave?"

"(ii.) Why is it, too, that at times, small-pox is attended with a truly terrible fatality rate, while at others the disease, though prevalent, can hardly be detected in the bills of mortality?"

(iii.) He further mentions that "for several years past small-pox has evinced, not only in this country but also in the West Indies and elsewhere, such a remarkable mildness that, as at Cambridge, the true nature of the malady has been matter for speculation, and such mildness has manifested itself not only in well-vaccinated but also in badly vaccinated communities?"

Why is this?

Those questions, which are put by Dr. Millard and by others too, as to the peculiar behaviour of small-pox in epidemics, are questions which, so far back as 1767, puzzled Mr. Holwell, F.R.S., who was a physician in India, where he resided for thirty years, and after being in practice for eighteen years, became a Governor of Bengal and one of the founders of our Empire in the East. The names of Broughton and Hamilton are also inscribed in the pages of Anglo-Indian medical history in the reign of James I. of England, who was a contemporary of the Emperor Jehangir.

The words used by Holwell so far back as 1767, in a paper before the Royal College of Physicians in London, are the following:—

"The salutary method (of inoculation of small-pox) now so happily pursued in England (howsoever it has been seemingly blundered upon) has the sanction of the remotest antiquity. For five and sometimes six years together it passes in a manner unnoticed from the few that are attacked with it, for the complexion of it in these years is generally so benign as to cause very little alarm; and notwithstanding the multitudes that are every year inoculated with it in the usual season, it adds no malignity to the disease taken in the natural way, nor spreads the infection, as commonly imagined in Europe. Every seventh year, with scarcely any exception, the small-pox rages epidemically in these provinces during the months of March, April and May, and sometimes until the annual returning rains, about the middle of June, put a stop to its fury. On these occasions the disease was of the most malignant confluent kind, from which few escaped that took the distemper in the natural way, and they commonly died on the first, second or third day of the eruption, and the Europeans usually fled from the settlements before the return of the small-pox season. There was hardly ever an instance of a native of the island of St. Helena, man or woman, who, if attacked when in Bengal with the disease in a natural way, escaped with life."

I am sure Dr. Millard will find some consolation in the remarks of that worthy physician of the old days, who found fearful epidemics of small-pox occurred in India every seven years which created sad havoc, while the periods intervening were mild as regards fatality. In the present time such mildness of attacks, as at Cambridge, has given rise to speculation as to the nature of the malady, because such mildness has been manifest not only in *well*-vaccinated but in *badly* vaccinated communities. The reasons for this mild condition are explainable, I think, and I trust that the following will be acceptable.

Several reasons are suggested for such a state of things as has existed since the days of Holwell, and probably long before his time. The last epidemic of small-pox which scared London a short time ago, and which happily was nipped in the bud through the highly efficient medical and sanitary organisation, shows that there is much of a similar condition of things in the matter of pandemic waves now as were present in the two centuries previous, and which pandemic waves depend largely upon the rainfall, or heat and insect-life, whether prolific or otherwise. A large rainfall carries away and dilutes the poison germs; heat encourages an increase; and insect-life loves heat. It was fortunate that in that year the rainfall was heavy, and the flies not so troublesome.

The questions which to my mind must necessarily arise are:—

(1) Is a certain natural immunity secured against small-pox by those who live in a country where it is endemic, but comes in a pandemic wave every seven years?

(2) Does vaccination and revaccination secure this protection from small-pox better than the natural immunity acquired; or is inoculation preferable?

(3) How is it that some people, no matter in whatever epidemics you place them, are proof against attacks?

(*To be continued.*)

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NOVEMBER 1, 1905.

THE STUDY OF INTESTINAL AILMENTS.

THERE is no more common remark made by practitioners in the Tropics than that they wish the diseases of the intestinal canal met with in warm countries were seriously considered by investigators. In this opinion every one will coincide, for our knowledge of the etiology and pathology of intestinal lesions has not advanced as have other departments of medicine, and the treatment of these ailments is for the most part empiric merely. Our knowledge of intestinal parasites has perhaps been advanced more markedly than any other department of this particular branch of study, but there is much to be done before even this department is raised to a position of scientific value, so as to serve as a basis for rational treatment. Research is still required to establish how most of these parasites gain access to the body, the point of the gut they primarily settle upon, how infection is to be prevented, by what drugs or other means they are to be got rid of. When we consider dysentery as we know it at the present day, it is plain we are but on the threshold of any understanding. The terms "amœbic" and "bacillary" dysentery are for the most part mere names, and do not carry with them conviction that the words really declare the pathological facts they would seem to imply. Some believe that dysenteric lesions advance from below upwards, holding that the infecting and infective material gains access by the anus; others maintain that the poison enters by the mouth, and that the large bowel is concerned in the disease because of its excretory functions; whilst yet a third group of observers are of the opinion that the primary trouble is one caused by mal-assimilation or from "cold," and that the presence of abnormal bacteria and amœbæ are merely secondary attributes of change.

Colitis in Europe has recently appeared to be prevalent to a degree unheard of twenty years ago; colitis and appendicitis came in together as commonly recognised clinical experiences, and the relation of the one to the other, if there is a relation, requires elucidation.

Sprue, muco-enteritis, chronic dysentery, chronic diarrhœa, membranous colitis, are terms indicating conditions rather than actual diseases, and call for closer pathological investigation. The many forms of intestinal lesion which at present we are content to group under the comprehensive title, "enteric ulcerations," require a long period of experiment and study before any scientific precision can be given to the perplexing descriptions we are acquainted with.

These are but a few examples selected from the field of intestinal diseases. They include some of the most familiar ailments with which mankind has been afflicted, and we know but little more of their true history than has been handed down to us from early times.

The call for further knowledge is amply justified. Several of the blood diseases have been, even within the past ten years, placed on a scientific basis, but the equally, if not the more, important and certainly the more common and deadly diseases, which find expression by way of the intestines, seem to have been neglected.

Review.

Mediterranean Fever.

Reports of the Commission appointed by the Admiralty, the War Office, and the Civil Government of Malta, for the Investigation of Mediterranean Fever under the Supervision of an Advisory Committee of the Royal Society. Part III. London: Harrison and Sons, St. Martin's Lane. Price 2s. 6d.

The contents of this valuable report is apportioned off into nine chapters, with an Introduction by Colonel David Bruce, C.B., F.R.S., R.A.M.C.

Chapter I.

On a Quantitative Bacteriological Examination of the Blood of 103 *Mediterranean Fever Patients.*

By Staff-Surgeon E. A. Shaw, R.N., Member Mediterranean Fever Commission, Malta.

The summary of the work dealt with in this chapter is drawn up by Staff-Surgeon Shaw as follows :—

Summary.

(1) *M. melitensis* has been demonstrated to be present in the peripheral blood of 68 per cent. (two out of three) of the cases examined in a series of 103 cases.

(2) *M. melitensis* exists in the blood in relatively small amount, not having been found in association with a less quantity of blood than 4 cub. mm., and that only in two cases out of 103.

(3) The higher the temperature of the cases for a few days before and at the period when blood is abstracted, the more likely is the latter to contain *M. melitensis.*

(4) The higher the agglutinating power of a blood during the fever the larger is the minimal quantity of blood yielding *M. melitensis* likely to be. A correlation is suggested between this and the patient's powers of resistance to *M. melitensis.*

(5) The smaller the minimal quantity of blood yielding *M. melitensis*, the earlier is *M. melitensis* likely to be obtained from the nutrient broth in which it is being incubated.

(6) *M. melitensis* is more likely to be present in blood abstracted in the late afternoon than in the forenoon. A correlation is suggested between this and the usual evening rise of temperature.

(7) No definite relation can be established between any chronological stage of the fever and the presence of *M. melitensis* in the blood; it is present both early and late in the disease.

Chapter II.

On the Infectivity of the Skin, Breath, and Sweat of Mediterranean Fever Patients.

By Staff-Surgeon E. A. Shaw, R.N.

The result of careful experiments and observation show that (*a*) the active infective agent of Mediterranean fever is not excreted by the *skin.* (*b*) To determine the examination of *breath* patients were instructed to gently blow through sterile broth contained in sterile tubes and this broth examined bacteriologically. Of 115 breath broth-tubes examined in this way in no instance was a single colony of *M. melitensis* found. (*c*) After careful examination of the *sweat* in no less than 251 specimens tested the *M. melitensis* was not recovered in any one instance.

Chapter III.

On the Vitality of the Micrococcus Melitensis Outside the Body in Different Environments.

By Staff-Surgeon E. A. Shaw, R.N.

Summary of results obtained as to vitality of *M. melitensis* outside the body, the same brand, generation, and quantity of *M. melitensis* being used throughout (except in B. 1).

	Days.
A. In mixed broth culture with—	
1. Laboratory contamination	7
2. ,, ,, ...	7
3. Organisms derived from sweat, skin, and urine	2
4. Organisms derived from sweat, skin, and urine	*Nil*
5 to 10. Organisms derived from sweat, skin, and breath; in each	1
B. In pure culture media with a reaction of + 10 acid—	
1. On agar slope (source of *M. melitensis* not noted)	276
2. In litmus milk (source of *M. melitensis* as in all other experiments) ...	144
3. In peptone broth (ditto)...	173
C. In urine (persistent acidity of Mediterranean fever urine as described—	
1. In unsterilised normal healthy urine, four experiments ...	2, 5, 2, and 33
2. In unsterilised Malta fever urine, six experiments	15, 24, 18, 43, 36 and 49
3. In sterilised normal healthy urine, one experiment	17
4. In sterilised Malta fever urine, one experiment	33
D. In diluted urine—	
1. Healthy urine diluted 100 times with sterile tap water	9
2. Mediterranean fever (ditto)	79
E. In urine contaminated milk—	
1. Goat's milk contaminated with 1 per cent. healthy urine	3
2. Goat's milk contaminated with 1 per cent. Mediterranean fever urine ...	38
F. In urine dried on fabrics—	
1. In Mediterranean fever urine dried on lint	5
2. In Mediterranean fever urine dried on navy serge	78
G. In sterilised tap water	50
H. In unsterilised tap water—	
1. Tank water	10
2. Potable water	72
I. In unsterile sea water, two experiments	11 and 46
J. Dry on cover slips	15

	Days.
K. In various earths—	
1. In sand free from organic matter ...	16
2. In various Malta soils—	
(*a*) In sterilised grey-yellow soil with added organic matter	91
(*b*) In sterilised reddish soil without added organic matter	80
(*c*) In sterilised white soil almost free from organic matter	24
(*d*) In sterilised well-manured soil rich in organic matter (bacillary forms of *M. melitensis* developed) ...	83
(*e*) In non-sterilised well-manured soil	Not recovered

Chapter IV.

On the Recovery of Micrococcus Melitensis from the Urine of Mediterranean Fever Patients.

By J. Crawford Kennedy, Captain R.A.M.C.

Summary of Result of Observations.

The excretion of *M. melitensis* in the urine would appear to be of two kinds:—

(1) A sudden enormous gush which stops as suddenly as it appears.

(2) A long-continued excretion of small quantities.

The period of disease most favoured is early convalescence or the last stages of the fever, especially just as a "wave" of fever is subsiding and the temperature reaching normal. It will be noticed that excretion tends to stop if another "wave" begins.

The time of day, or rather the period of the twenty-four hours during which the excretion is greatest, appears to be between 6 p.m. and 6 a.m. On fourteen days on which the urine was examined at both these times *M. melitensis* was recovered, and taking the average daily excretion from the morning and evening, it was found to be twenty colonies per cubic centimetre for the morning to fourteen for the evening. On the fourteen days mentioned above, *M. melitensis* was found thirteen times in the morning urine and only eight times in the evening.

The length of time after recovery during which the excretion may continue appears to be considerable. In one case the patient was discharged from hospital cured, but with orders to attend daily at the medical inspection room. He was supplied with sterile test-tubes and he daily supplied me with a fresh sample of his morning urine; on the seventh day after his discharge I found six colonies per $\frac{1}{3}$ cc.

The longest period (temperature above 99°) after which excretion has been proved is thirty-three days; but one case is recorded where from the sixty-sixth day to the 111th day temperature never reached 100°, yet *M. melitensis* was recovered all this time. There were, however, slight periodical rises to 99·4°, indicating the presence of infection in the system.

The most severe and prolonged cases were the ones that provided the most recoveries. The latest day of disease on which *M. melitensis* was recovered was the 249th.

Chapter V.

On the Vitality of Micrococcus Melitensis in Urine (in which it has been Excreted), on Cloth, in Dust, Sterile Tap Water, and Sterile Milk.

By J. Crawford Kennedy, Captain R.A.M.C.

Summary of Observations.

M. melitensis in the condition in which it is excreted in urine will retain its vitality—

(1) Dried on cloth for seventeen days.
(2) In dust, for less than thirteen days.
(3) In sterile tap water. Not recovered.
(4) In sterile milk for sixteen days.

M. melitensis derived from urine, grown on media, and then added to Mediterranean fever urine, retains its vitality—

(1) Dried on cloth for fourteen days.
(2) Dried in dust for forty-four days.
(3) Mixed with sterile tap water for twenty days.

Chapter VI.

A Preliminary Note on the Examination of the Blood of Goats Suffering from Mediterranean Fever.

By Dr. T. Zammit.

On June 14th I examined the blood of six goats and obtained the following results:—

Goat No. 1.—Strong immediate reaction, in dilution of 1 to 20.

Goat No. 2.—Strong immediate reaction, in dilution of 1 to 20.

Goat No. 3.—Strong reaction, after half an hour.

Goat No. 4.—No reaction.

Goat No. 5.—Strong reaction after half an hour.

Goat No. 6.—Strong immediate reaction.

Chapter VII.

Preliminary Note on Goats as a Means of Propagation of Mediterranern Fever.

By Major W. H. Horrocks, R.A.M.C.

Conclusions.

The results obtained show that some of the goats in every herd examined are suffering from Mediterranean fever. The *M. melitensis* is exuded in the milk in enormous numbers when the disease has been present sufficiently long to cause a change in the physical characters of the fluid. It is also excreted in considerable numbers even when the animals are in "full milk," and no changes have occurred in either the physical or chemical characters of the milk.

The *M. melitensis* is also excreted in the urine of goats suffering from Mediterranean fever, but up to the present it has only been found when the disease has existed for some time and physical changes have occurred in the milk.

Chapter VIII.

Examination of Goats' Blood for Reaction to Mediterranean Fever.

Of 161 goats examined 77 gave no reaction; 84 reacted to Mediterranean fever.

Chapter IX.

Results of Examinations for the Isolation of Micrococcus Melitensis from the Blood, Urine, and Sputum of Cases Infected with Mediterranean Fever in Haslar Hospital.

By P. W. Bassett-Smith, Fleet-Surgeon, Haslar.

Blood.—In all 27 bloods were examined from 24 patients with 16 positive and 11 negative results.

Urines.—In all 46 urines were examined of 18 patients; in two instances typical colonies of *M. melitensis* were present as a pure culture, both being from the same patient.

Sputum.—No colonies of *M. melitensis* met with.

In the introductory chapter Colonel Bruce writes: Dr. Zammit communicated some notes on the feeding of goats with *M. melitensis*, which seemed to show that the goat is to some extent susceptible to Mediterranean fever. The following experiments were made by Dr. Zammit:—

Experiment 1.—*White Goat.*

To note the effect of feeding goats on material containing *M. melitensis*.

1904—
Sept. 15.—Examined blood for agglutination. Negative.
Sept. 18.—Fed this goat, adding the contents of a culture of *M. melitensis* on agar to its food.
Dec. 3.—Blood has reacted in dilutions of 1 in 20 to 1 in 100, but the temperature curve shows no rise. Fed again in the same way.
,, 23.—Blood reacts 1 in 300.
1905—
April 29.—Blood reacts 1 in 100. Goat still alive.

1904— *Experiment* 2.—*Red Goat.*
Dec. 3.—No blood reaction. Fed one tube agar.
,, 5.—Fed again.
,, 15.—No blood reaction.
,, 23.—Blood reacts 1 in 20; 1 in 50 after half an hour.
1905—
April 29.—Blood reacts 1 in 50.

Dr. Zammit considered goats to be susceptible to Mediterranean fever, and that the disease is spread to human beings by goats.

On June 23rd, 1905, Major Horrocks wrote that he had discovered the *M. melitensis* in the milk of an apparently healthy goat, and on the 26th he further wrote that he had already found the *M. melitensis* in the milk of five goats taken from two different herds, and that Dr. Zammit had found it in the blood of one of these goats. Horrocks also said that the milk of the goat fed by Dr. Zammit last September was still crammed with *M. melitensis*. It would therefore appear that the Commission are on the eve of an important and may be far-reaching discovery.

On July 18th, 1905, Colonel Bruce received preliminary notes from Major Horrocks, Captain Kennedy, and Dr. Zammit, on the propagation of Malta Fever by means of goats.

These notes show (1) that one or more apparently healthy goats in every herd are excreting *M. melitensis* in their milk and urine; (2) that about 50 per cent. of the goats in Malta react to Mediterranean fever when examined by the serum agglutination test.

It may be objected that no exact proof exists that the drinking of milk containing *M. melitensis* will give rise to the disease in man. When we take, however, into consideration the results of the feeding and inoculation experiments on monkeys, it may be assumed with safety that the disease is propagated in this way, and that no time should be lost in removing such a grave and insidious danger to the public health.

Correspondence.

TO THE EDITOR OF THE "JOURNAL OF TROPICAL MEDICINE."

Dear Sir,—In the Journal of Tropical Medicine, July 1st, 1905, under the heading of "Recent and Current Literature," you reproduce an article from *L' Echo Medical du Nord*, dealing with the subject of Ankylostomiasis. A sentence in this on the use of thymol reads as follows: "It is necessary to avoid oil as a purgative or in any other way, chloroform water, glycerine or ether, &c."

It seems to me that the question of the use of oil as a purgative is of such importance, and the statement here made open to so much doubt, that one feels inclined to appeal to you, Mr. Editor, for an authoritative opinion on the subject.

In this region ankylostomiasis abounds. My own routine treatment is as follows: No food is allowed the evening before the thymol is administered and a large dose of castor oil is given. At 6 a.m. the next morning 30 grains of thymol are administered; the same is repeated at 8 a.m., and at 10 a.m. half an ounce of castor oil is again given. I allow food to be taken as soon as the bowels have been well moved.

I have never seen any evil effects follow the use of the oil.

I was speaking the other day to a Japanese physician with considerable experience in the treatment of ankylostomiasis, and he always uses castor oil with thymol nor has seen any evil result following on the use of the oil.

Scheube ("Diseases of Warm Climates," 2nd Edition) allows castor oil as a purgative after thymol. So at least I am in good company.

I am, Sir,
Yours faithfully,
James L. Maxwell, M.D.

Tainan Mission Hospital, Formosa,
August 29th, 1905.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the Journal of Tropical Medicine *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Revista de Medicina Tropical," Havana, April, 1905.

Yaws.

"Notas Sobre Polypapilloma Tropicum" (Notes on Yaws). By Dr. Juan Guiteras, Professor of Tropical Pathology at the University of Havana.

These notes are taken from a paper by Dr. Guiteras which he read before the Academy of Science of Cuba

on April 14th, 1905. He stated that it was not his intention to offer a dissertation on frambœsia, but simply to avail himself of that occasion for his colleagues to examine histologically this curious granuloma, in order to call attention to the distribution of the disease in the Republic, and to the argument that the said distribution offers against the theory maintained by Hutchinson and others, who hold that the papilloma is nothing else than a manifestation of syphilis.

Dr. Guiteras understands that this affection which goes by the name of "yaws" in English, and "pian" in French colonies, is generally known as "bubas" in Spanish and Portuguese countries; but he fancies that in Cuba several diseases are included under the name of bubas.

The true "frambœsia" or "polypapilloma tropicum" is now restricted in Cuba to a somewhat limited portion of the province of Santiago, namely, to the district of Palma Soriano. He believes that formerly the disease had a more extensive distribution in that island, which was probably maintained by the importation of negroes from the West Coast of Africa, which is one of the endemic centres of the disease.

Although the clinical history of frambœsia undoubtedly recalls that of syphilis, it appears to him that the epidemiological history of the disease in Cuba is a conclusive argument against the opinion of those who hold with Hutchinson that the two diseases are identical. As a matter of fact, frambœsia has gradually diminished in the island, being now restricted to a small mountainous district which has very little communication with the exterior. Syphilis, on the contrary, is not decreasing, and, as is natural, has its principal foci in the commercial centres on the sea-level.

If any other argument were needed, they would find it in the microscopical sections shown that evening. The lesion was characterised by a marked hyperplasia of the papillary body and of the interpapillary prolongations of the epidermis. There is a perceptible cellular infiltration of the papillæ with much dilatation of the vessels, and occasionally also small hæmorrhages —a true papillitis. In other parts there are accumulations of polynuclear leucocytes which sometimes give rise to the formation of small abscesses which are doubtless due to secondary infections.

Moreover, this said lesion which has just been so briefly described is the only lesion in frambœsia. The initial lesion and the secondary lesions are always the same; these conditions most certainly never occur in syphilis.

Neither are the peculiar alterations of the vessels which are so characteristic of syphilis to be found in frambœsia.

The experimental inoculations and the manifestations of immunity prove also, from an etiological point of view, the separate nature of these infirmities.

J. E. NICHOLSON.

New Drugs.

"Appendix to Squire's Pocket Companion." Published by Messrs. Squire and Sons, 430, Oxford Street, London, W., 1905.

DRUGS USEFUL TO PRACTITIONERS IN THE TROPICS.

Acetopyris (antipyrine aceto-silicylate) is a good antipyretic without deleterious action on the heart.

Acid Formic. — Formic acid in 2 to 5-minim doses, given in aerated waters, and the sodium or potassium formate in 45 grains, given thrice daily and continued for ten days, increase power of resistance to fatigue, and serve as a stimulant in lassitude.

Atoxyl, an aniline compound, contains 37·69 per cent. of arsenic, and is said to be forty times less toxic than Fowler's solution, has been tried with benefit in the treatment of trypanosomiasis.

Dose, ¾ to 3 grains (= 0·05 to 0·2 gramme). Globules = ½ grain (0·032 gramme) in each; Elixir = ½ grain (0·032 gramme) in each fl. drm. (3·6 cc.); injection (sterilette) = ½ grain (0·032 gramme) in each 17 minims (1·0 cc.).

Bael Fruit Confection.—A confection prepared from the fresh Bael fruit imported direct from India in the spring months. It retains the odour and flavour of the fresh fruit. Dose, one teaspoonful. Used in dysentery.

Chrysoidin suggested for treatment of trypanosomiasis.

Creosote was supplied to each Japanese soldier in pills as a prophylactic against dysentery.

Malachite Green.—One cc. of a 1 in 2,000 solution of malachite green in normal saline has been injected subcutaneously in trypanosomiasis.

Quinine.—Solutions of the acid hydrobromide and acid hydrochloride (which latter salt, by the way, was made official in the British Pharmacopœia, 1898) are put up in hermetically sealed glass capsules, and may be obtained in white or in dark actinic glass. Each cc. contains 7½ grains of the particular quinine salt.

Saloquinine.—This tasteless substitute for quinine has been further recommended in 15 to 20-grain doses in the treatment of malaria.

Thymol has been recommended in ankylostomiasis in two or three doses of 2 grammes (= 30 grains), at two hours' interval, after a little coffee or broth in the early morning, and after a calomel and senna purge. Six grammes is the limit advised, and a dose of Epsom salts should be given two hours after the last dose to eliminate the thymol from the intestinal tract. Children, ¼ to ½ the full dose. The administration of any of the usual solvents of thymol must be avoided.

Notices to Correspondents.

1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the JOURNAL OF TROPICAL MEDICINE should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communications.

NOTES FROM ANGOLA.

By F. C. Wellman, M.D.
Corresp. Memb. Am. Soc. Trop. Med.

(*Continued from p.* 320.)

Note VII.—Tuberculosis and the Angola Highlanders.

The writer has seen the rapid spread of tuberculosis among the natives of South Africa ascribed to the fact that they sleep with their heads covered. The natives of Bihé, Portuguese West Africa, sleep in the same manner, often in huts with almost no ventilation ; and, although tuberculous whites and civilised blacks are and have long been continually coming into the country, I have never yet seen an incontestable case of tuberculosis in a native of the district, although I have repeatedly examined suspected cases both microscopically and bacteriologically.

Note VIII.—Observation on the Subcutaneous Injection of Quinine.

In view of my experience in this region I am inclined to believe that the numerous accidents arising from this mode of administering quinine are to be attributed to causes other than the lack of asepsis on the part of the operator, or the effect of the salt on the tissues. In the course of hundreds of injections I have had but one slight abscess, which healed within a few days. These injections include whites and blacks, and young and old. The little operation has always been done under aseptic precautions, and the drug invariably placed the full length of a rather short gold or platinum hypodermic needle into the muscle. I have always used either the gluteal or deltoid region, and employed some salt of quinine which is freely soluble in water alone. I suspect that peculiarities of climate, or rather particular micro-organisms dependent on peculiarities of climate, are involved in the very uneven results obtained in different parts of the world from this invaluable method (under favourable conditions) of treating severe malaria infections.

Note IX.—On the Angola "Nutmeg" as an Abortifacient.

In this Journal for July 1st, 1905, p. 205, there is mention of a case of nutmeg poisoning from Australia, the spice having been taken with a view to producing abortion ; and the Editors ask if practitioners in the Tropics can give any account of nutmeg as a drug in the treatment of disease, or of its use as a means of procuring abortion amongst natives of the Tropics. The true nutmeg (*Myristica moschata*, Thunberg) is not indigenous in this part of the world, but perhaps a word on its local substitute may not be without interest. The so-called Angola "nutmeg" is the seed of a species of *Monodora* (*M. angolensis*, Wetivitseh), of which there are three kinds (var. *sempervirens*, var. *decidua*, and var. *macrophylla*). The species resembles *M. myristica* var. *grandiflora*, Bentham, but is smaller. The seeds from the fruit are called "Olomepe," and are esteemed by the natives on account of their aroma. which cannot be distinguished from that of the genuine nutmeg. They are used as an aromatic spice, and also as medicine. In cases of bowel complaints with severe pains, the "nutmegs" are boiled and the decoction drunk. The general properties of the seeds are considered by the natives to be tonic, stimulating and stomachic. If poisonous, it must be in large doses, as in some districts they are very freely used. I have heard of them being used to procure abortion, but always in conjunction with other plants, generally poisonous *Leguminosæ*.

Note X.—Human Trypanosomiasis in Southern Angola.

In Note V. of this series, I mentioned that sleeping sickness is not endemic in Southern Angola, and that the tsetse-fly of that region (*Glossina palpalis wellmani*, Austen) was probably not a transmitter of the disease. Since writing the note in question, however, I have found trypanosomes in the blood of a Bantu man, aged 30, who had never been out of the district. This observation was subsequently confirmed by Mr. W. E. Fay, a former student of the London School of Tropical Medicine, who shortly afterwards encountered trypanosomes in the blood of a Bantu in Northern Bailundo, who was suffering at the time from malarial fever, the parasites being seen in his blood, together with the trypanosomes. Both these patients had frequently been in the localities infested by *Glossina palpalis wellmani*. I am publishing, through the American Society of Tropical Medicine, a preliminary note on these observations, and hope to shortly publish a more detailed study of the question. In the meanwhile, I record this as a supplement to Note V., it being an interesting fact that trypanosomiasis extends down the west coast of Africa, at least as far south as Benguela. The fact that in the course of hundreds of blood examinations in my former district I failed to demonstrate the infection, coupled with my finding the parasite so quickly in a different district, suggests that the disease may have a peculiar distribution, and, granting its connection with sleeping sickness, that *Glossina palpalis wellmani* may yet assume importance as a carrier of the latest disease.

Note XI.—Myasis and its Prophylaxis.

Myasis, intestinal and cutaneous, is not seldom seen in this region. Several months ago, I sent from Bihé district some dipterous larvæ, which I had removed from the subcutaneous tissue of man and dogs (the imagines of which were unfortunately not secured) to Professor McFarland, of Philadelphia, and more recently have seen a case in which larvæ of *Anthomyidæ* were passed *per rectum*. Their presence in the intestines was accompanied by severe pain, fever, and diarrhœa. I determined the life-history of the fly, and larvæ, puparia, and imagines have been sent home for determination and description, which when received will be mentioned in these notes.

Since writing the above, I have succeeded in producing experimental myasis in goats, using a fly (*Sarcophaga Sp.*), with habits much like the above. The animal was tied under a mosquito curtain in such a manner that it could not move its head, and the flies liberated under the curtain. The larvæ were

deposited in the nostrils, and produced erosions and necrosis. Controls were used. A full account of this experiment, including the *post-mortem* findings, together with a description of the fly used, is being published in America. In view of these observations a rational prophylaxis would consist in keeping all cooked food carefully covered, and in a careful use of a mosquito curtain during the *siesta*.

Note XII.—Ascariasis in the Tropics: Analysis of 158 Cases.

Having some time ago read an interesting analysis of the symptoms presented by 132 cases of this infection which was published by Mr. Walter H. Haw, of Cape Colony, in the *Lancet* for June 18th, 1904, I recently prepared for my own information a similar digest of my series of cases mentioned in this Journal for April 15th, 1904, which were, of course, all verified by microscopical examinations, and of which I retain the records. It having occurred to me that the result might, if published, be of interest to others, I include it in these notes. In arranging the statistics I have also consulted, for the sake of comparison, a study of ascariasis in South China, published by Mr. Preston Maxwell, F.R.C.S., in the Journal for October, 1900. By putting my own observations beside those of Messrs. Haw and Maxwell in the form of a table, the practical identity of the symptoms to which the worm gives rise in the different countries is strikingly shown. The figures in the two middle columns refer to the number of times each symptom was noted.

List of Symptoms	Author (158 cases)	Haw (132 cases)	Maxwell (No. not given)
Abdominal pain	43	29	+
Anorexia	42	22	+
Fretfulness	42	19	—
Convulsions	41	11	+
Gritting teeth	40	—	+
Debility	40	6	+
Fever	39	41	—
Nausea	34	5	+
Sleeplessness	32	19	+
Diarrhœa	30	27	+
Pallor	29	6	+
Vomiting	28	38	+
Anæmia	22	—	+
Night frights	21	19	+
Sleep talking	20	19	—
Cough	18	31	—
Emaciation	18	14	—
Masses in abdomen	18	2	—
Palpitation	17	2	—
Open-eyed sleep	16	1	+
Pruritis ani	16	—	—
Cephalalgia	14	9	+
Constipation	13	10	+
Swollen abdomen	8	3	+
Increased appetite	7	2	+
Delirium	2	4	—
Septic peritonitis	1	—	—

I have excluded from the table a few symptoms mentioned in the articles quoted, but which I have not myself seen. Some of my cases are counted more than once, several symptoms occurring in the same patient.

Bailundo, Angola, October 1st, 1905.

(*To be continued.*)

THE RATIONAL TREATMENT OF DYSENTERY.

By V. G. Desai, L.M.S.,

King's College.

Dysentery is a local disease of the intestines, and it stands to reason that it should be treated locally. The healing properties of drugs, when taken by the mouth, must be changed before they come in contact with the inflamed surface, and their curative properties thereby reduced. The treatment of dysentery by irrigation or injection is the most rational and highly satisfactory method. Just as any external inflamed surface is washed with soothing lotions, so should an internal surface be washed. An ulcer on the foot is not treated with drugs, astringents, &c., before its foul secretions are removed; yet an ulcer in the colon is treated with astringents without any previous cleansing. Is not an inflamed bladder washed out? Drugs are not trusted to in the inflammation of the bladder; why, then, should they be solely trusted to in the inflammation of the neighbouring intestines. The nasal and ear cavities are washed out before any drugs are applied to them; why should the intestines be not washed out as a routine? In dysentery the inflamed surface covered by the sticky mucus absorbs very little; washing hastens absorption. The general principle of cleansing first and drugs afterwards is followed in every inflammation of the body except that of the intestines. Is not the ordinary medicinal treatment of dysentery quack-like, because the primary principles of treatment are set aside. The present method of treatment is logically and practically ridiculous. Every dysenteric patient ought to be treated with the irrigation process mainly and drugs should be supplementary only. The writer firmly believes that the death-rate of dysentery will be lowered by this process of treatment. By giving injections *per rectum* of a large quantity of well boiled water, the putrefying matter which is irritating the intestines, whatever it may be, is removed at once. About two pints of water with a little table salt serves the purpose. The result is that the abnormal peristalsis stops, the tenesmus subsides, and the inflamed surface comes to its normal state by the process of rest. The septic toxins which depress the spirits are removed more quickly and the patient becomes more cheerful. The fever and thirst subsides, as no time is allowed for the toxins to be absorbed. By irrigation, not only do we not trust the work of removing waste matter to Nature, but we directly spare her energy in that direction. The sparing of Nature's energy is manifested in the upper part of the alimentary canal by the rapid absorption of milk. The patient becomes hungry and he can take and absorb more food; his tongue loses the thick fur and his motions become less frequent. The recovery is very rapid. Injection treatment must be resorted to early in the inflammatory and adynamic cases in order to save the patient; for death is well-nigh certain without it. The patient is to be placed on his back with his buttocks well raised by a pillow placed beneath them. The hot water should be thrown into the bowels through an irrigator at a very slow rate. The abdomen is to be massaged gently during the process; by this method the whole of the large

intestines is washed out. Although thoroughly boiled water is good enough, still the writer always uses boric acid in the injection. One drachm of boric acid with a pinch of soda bicarbonate to one ounce of water is the strength used by him. The alkaline soda dissolves the sticky mucus, and boric acid works as a mild astringent and antiseptic. These drugs, when added to the injection, give immediate relief when borborygmic and fever are prominent symptoms.

The medicines must be absorbed quickly, and better after such alkaline washes. Many cases which were given up as hopeless were successfully treated by the writer in the above way.

Drugs.

Holarrhœna Antidysenterica.—N. O. Apocynaceae, native name, Pandara korda. It is a small bushy plant very common in South India. The bark of the root only is to be used. It is thick and of a dirty white colour, but quite light in weight. It is to be livigated with sour whey; it should be freshly prepared every time for use. One wine-glassful of the livigated solution is to be taken four times a day.

The whey solution (lactate of "tannin") is pleasant to the taste and is carminative and diuretic. It raises the blood pressure and produces flushing of the face, fulness in the head and a sort of pleasant intoxication. It has very marked febrifuge properties and produces diaphoresis. It does not require the help of opium. The patient regains appetite, the tongue becomes clean, the motions become yellow and less frequent, the fœtor of the motions disappears and the tenesmus stops. The intestines do not become distended with gas, the result of fermentation and decomposition. The patient becomes cheerful as the manufacture of toxins is stopped, and he sleeps well. This drug is a capital remedy in the "white" variety of dysentery. Holarrhœna is far superior to ipecacuanha in every way, as none of the bad effects of the latter were ever noticed by the writer; besides it is cheaper than ipecacuanha. It is a pity that it is not even mentioned in the *British Pharmacœpia.*

Ipecacuanha is good in the "red" variety of dysentery, but some nervous persons cannot bear even a grain of it. Sine-emetine is not as good as the pure drug, and even then it produces nausea in some. Its great defect is that opium has to be given in large doses to check the nausea. The drug is costly, the patient has to remain without nourishment for a long time, and has to lie in bed and so cannot attend to his daily work. Holarrhœna has none of these drawbacks. Ipecac. produces diarrhœa and it does not kill the fœtor of motions. It is not febrifuge, and it produces great depression, sometimes so much so that it renders some people melancholic. It works better when injected *per rectum.* Opium requires to be added to this injection. In the Ipecac. treatment quinine requires to be given to control the fever. It should be injected *per rectum.* It works then as a stimulant antiseptic to the mucous membrane as well.

Castor Oil.—The O. C. Ricini of B.P. invariably cures mild cases of dysentery, especially in children. It flushes out the intestines and removes irritating matter, and is astringent in its after effects. It must not be used too long, for there is the chance of setting up catarrh of the intestines, if it has not been judiciously selected.

Saline Mixture.

℞.	Sodii sulph.	...	...	dr. i.
	Mag. sulph.	...	...	dr. i.
	Sodii chlor.	...	...	Gr. x.
	Aq. chloroform		...	Oz. i.
	M. Ft. Mist.	...	...	T. D. S.

This saline solution is an efficient cholagogue in dysentery, suited especially to plethoric people. By its cholagogue property it renders the intestines antiseptic and the motions become yellow, by its purging property it flushes and removes the irritating matter.

Liquor Hydrargyri Perchloridi cures the "white" variety of dysentery by its antiseptic properties; its griping tendency is fairly well corrected by chloroform water.

Bismuth and other such astringent drugs irritate the intestines more and more by solidifying the contents. They oppose Nature in her efforts of cure, viz., removal of irritants by efflux of water. This line of treatment is absurd.

Opium relieves pain, no doubt, but the beneficial effect is delusive, for it hinders the peristaltic movement of the intestines and so the irritating matter remains longer in contact with the inflamed surface. It deranges the liver and upsets the digestion. Opium is the chief factor in the high death-rate of dysentery in children. It may occasionally prove beneficial when given by way of rectal injections.

Calcium chloride checks hæmorrhage in acute cases, it can be used with confidence in 30 gr. doses every four hours. When a patient has lost much blood port wine might be injected *per rectum.*

Silver nitrate proves wonderfully effective in many subacute and chronic cases. It may be given in one grain doses every four hours—the B.P. dose is very small. In order to get its full antiseptic effects it must be given in big doses fearlessly, it may be injected *per rectum* in every chronic case, using as much as 10 grains to one pint of hot water. At times a little opium has to be added to this injection, as it produces smarting in some people. Silver nitrate is the drug which can effect a cure in dysenteric ulcerations with greatest certainty.

Diet.—We must not forget that scurvy is one of the causes of dysentery. Pure milk is the best diet both in acute and chronic cases. A pinch of table-salt should be added to the milk. No other food is admissible in acute cases. Soups must not be given on any account, as they produce decomposition in the intestines, the motions stink horribly and the temperature rises. Good port wine should be given freely to debilitated people. Bael fruit syrup freshly prepared from partially ripe fruits is a good astringent, but it is not a specific. Red gum syrup and mangostein syrup work well as beverages to quench the thirst. Coriander well pulverised with equal quantity of sugar-candy is a useful carminative. Albumen water is as bad as soup.

SMALL-POX INOCULATION IN INDIA.

By Major G. H. Fink, I.M.S., M.R.C.S., L.S.A.(Lond.).

(*Continued from p.* 321.)

To these questions I will endeavour to give my answers collectively and not separately. After having been in India, where I have observed that the sanitation and water supply differs in one district from another; and where small-pox prevails in some but is absent from others; and in the measure in which sanitation and water supply are good, so might the results from epidemics be expected. Many persons believe that doctors secure their immunity from various infectious and contagious diseases by some elaborate and secret recipe of their own which they will not divulge to anybody else lest there be no patients for the doctors. I am sure we are all much obliged to those persons for the credit bestowed on our Art of securing such, by the learned and artful prescriptions they suggest for the reason of our immunity; but there is not a single one present here, I hope, notwithstanding this, who does not believe in the fact, that doctors and nurses are comparatively free as a rule from catching infection as other people. Our great prescription, I maintain, is our faith and belief in the doctrines we teach and which we must largely carry into practice in a conscientious or an unconscious manner, and thus our familiarity breeds a contempt for the germs or armies of micro-organisms which we daily battle with in our daily rounds. I do not mean to say that medical men and nurses do not fall victims to epidemic diseases, for this would be nonsense; but we possess no prescription beyond the ordinary precautions of cleanliness and wholesome living—our antiseptics—and know at the right moment, perhaps, when to put on the brake, as we are trained in this direction, which the laity frequently neglect in the midst of the art of money-making and bustling which the world is largely infected with and which doctors as a rule are largely free from, hence the law of compensation as an exchange.

> The remedies oft in oursslves do lie,
> Which some ascribe to Heaven.

In the Tropics it is strikingly shown how the difference in sanitation and living secures a certain immunity against various diseases when present in an epidemic form among a large community. The plague in the East is an illustration as to the benefits enjoyed through healthy and wholesome living, good sanitation and plenty of sunlight and pure air in the houses, for Europeans have suffered less than the natives. Doctors, working in the thick of an epidemic, though some fall victims, largely escape through these reasons, I feel, for, before any germ can get a foothold, the soil in the human system must be ready to receive it, and then the mischief begins. Such a prepared soil is overcome through temperate living and sanitation, and in these I include exercise short of fatigue, proper sleep and rest. I know one medical gentleman who lived in the thick of a great city amid cholera, small-pox, malaria, and other vile diseases, and at last became like a piece of parchment in India, and this condition seemed, from his own account, to be induced through successive years of inoculation of his system through the atmosphere which made him proof against all diseases. He still lives after many years in the Tropics, and is now in this country, but looks less of the parchment texture that is acquired by the veterans of tropical conquests against the army of micro-organisms than he used to.

It is, I think, now an accepted fact that such an inoculation of the system can secure immunity if the system be not allowed to run down too rapidly, and the phagocytes thereby lessened or weakened. I say this, because, if merely long residence in the Tropics, without other reasons, secured this immunity, then the several generations upon generations, during which epidemic waves have come and gone, should have made the inhabitants of India proof against anything; but such is not the case. The reason, I believe, is lack of knowledge on the part of the majority, when to put on the brake. Another thing to be noticed is, that when an epidemic of great severity comes, as a rule, it carries off large numbers at the beginning and then abates, and I feel that it takes off the predisposed where the phagocytes are weak, while it leaves those who are either better in this respect or have become gradually inoculated, and thus secured immunity through attenuation of the virus while the epidemic is proceeding and health is maintained *pari passu*. It goes without argument, that in *most* diseases the germs will also find out the weak spots in an individual, whereas if the person be healthy and robust, and with a good supply of efficient phagocytes, he stands a good chance of escaping from an epidemic.

If germs or sera can be introduced hypodermically with a lancet or point of a hypodermic syringe, I do not see why they also cannot be conveyed to the human body through the mucous surface, by contact, and there become absorbed while in the ordinary channel of inoculation; and if a person is fortunate enough to arrive in India at an intervening period after an epidemic has spent its force, when there is only a mild epidemic of a disease (small-pox for example), if he or she be in good health, though unvaccinated, three to four successive years of care with good health in the midst of mild epidemics would secure, I should say, an immunity in that person. In the case of a severe epidemic and high mortality it is a fight between the powerful germ and phagocytes, and then it greatly depends upon one's general health and surroundings.

Then, again, another question arises. Would it be possible for a child *in utero* to have secured immunity through a healthy mother who escapes from an epidemic of small-pox of a mild character, or several mild epidemics, which has secured immunity for the mother? Such a child born, when grown up, if even not vaccinated at all, might, if immunity through its mother be secured *in utero*, either escape an attack of small-pox during an epidemic after its birth, or, if it suffer, it might be only a mild attack, which would give rise to speculation perhaps as to the nature of the disease being truly small-pox. The resemblance of such cases might be nearer to chicken-pox as the epidemic in the West Indies lately was the case.

I merely mention these points as *suggestions*, and not as facts, since they are of interest to follow up, and this can only be done carefully and thoroughly

by a medical-history being maintained by every family, of the ailments the members have suffered from from generation to generation, and which would be only accessible to the physician or surgeon, and nobody else. This is a matter which comes within the domain of medical ethics and the family physician in his relation with his patients. Such a medical-history of epidemics is also sadly required in every town, village, or hamlet, by successive generations of sanitarians and medical officers in the form of a continuous history of the place, in order to be able to trace an epidemic, and see whether successive epidemics limit themselves to particular foci or dwellings, their mode of spread, and the mortality and immunity certain people enjoyed, and so forth. It means a stupendous task; but from a strictly medical and scientific point of investigation it is worth the trouble, and I feel sure would overcome many difficulties in the future, and bring further progress in sanitary and medical matters which would bear fruit rapidly—clinically, as well as from the research point of view.

We know, for instance, from the history of a great many epidemics such as plague and small-pox, that bad sanitation and dirt are frequently the traceable origins; bad sanitation attracts flies; flies convey germs to our food and drink; insects and birds eat flies; animals and birds eat the insects and birds in turn; vultures and other scavenging birds eat dead animals and corpses, and so carry the germs to distant places, which, if insanitary, an epidemic breaks out; but if clean and sweet there is no foothold given to germs which are thus starved out and die from want of a dirty area to breed in, or in other words, suitable pabula to exist upon. If the germs settle on a healthy population with good sanitary surroundings, there is a very poor chance of an epidemic; but if on an unhealthy population with bad sanitary surroundings there is immediately an outbreak. It must also be noted that in this world of "change, constant change," there might be a place which to-day is considered healthy and well cared for as regards sanitation, because the governing body are advocates of hygiene and public health; and in another few decades the place falls off from want of the same interest, and an epidemic is present. Why? Want of interest in sanitation, hygiene and public health, and deterioration all round. There is very often an excuse that there are no funds and too little time for these matters; but a great deal too much of bustle and money-making which saps the health, as people have scarcely enough wholesome food and time to digest, and perhaps too little rest and sleep at night. So that the causes of epidemics are traceable to accidental causes as well as most palpable causes which are preventable.

Besides these modes of conveyance and causes for an epidemic, there is one other I would like to mention. Amid the one eternal bustle and battle in life daily, the army of micro-organisms, like vegetable seeds, are borne silently along in various states of combination through the atmosphere, or by means of rivers and flowing streams into remote countries. The combinations in which the materials of future thought and feeling are as imperceptibly carried into the human mind. The more people know of germs and their methods of attack, the greater their desire to combat against them by modes of sanitation and sanitary engineering—for which the germs at present have the greatest contempt, and seek out our flaws and defects in the most ingenious, and as it were, intelligent manner, which almost defies detection at times. Education in these matters creates an educated desire to resist the causes. In my opinion the prevalence of mild, and severe epidemics is explainable through these channels and causes at work constantly, and life has its disasters and victories daily, nay hourly. Much, therefore, depends on the soil, the sanitation, and the health of the people, as well as their education and inclinations. A medical-history in each family and a medical-history of each district, town, or village, if maintained continuously for a few decades, would show that there is this strong link or connection between the soil, the seed, or germ, and the opportunities given for multiplication and development through food and drink, over-fatigue, and exercise, want of sleep, or bad sanitation. Meteorological and other conditions doubtless also weigh; but whatever these conditions are from year to year, or from day to day, if our sanitary arrangements and personal and domestic hygiene are soundly maintained, I defy any army of micro-organisms, even with the assistance of the Meteorological Department, to break through the cordon of sentinels in our body which we have placed. The meteorological conditions are useful when we want to wash out a dirty town or village. If it be necessary to obtain the medical-history of your patient for the successful treatment of his or her disease, it is quite as necessary to get a clear medical-history of a district or village from year to year in order to deal with an epidemic successfully in the interests of the public health, for there is no smoke without a fire; there is no epidemic, infectious, or contagious disease without a germ as the cause.

Another important point to note in the consideration of epidemics, their virulence and mildness respectively, is the constitution of the people it lays low, whether gouty, rheumatic or syphilitic, a point we carefully consider in all diseases. Why not in epidemic infectious and contagious diseases!

It is also necessary to know if in an epidemic of small-pox, persons, or children, who have had chicken-pox or other diseases, are attacked in larger numbers, or more virulently or otherwise, than persons who have not suffered from these diseases? In these constitutions certain pabula exist for germs of certain diseases to live and become prolific, and we wish to know if acute or chronic infectious diseases are more influenced by such conditions as the habit or constitution of a person supplies the pabulum or combustible material for an attack and determines largely its nature and character, and we very often treat such a habit in any disease as well as the disease itself.

With regard to the question of vaccination or re-vaccination securing immunity or preventing small-pox, I feel sure from my personal experience out in the Tropics that it is very necessary to vaccinate and re-vaccinate a child or adult every five to seven years at least. I remember on one occasion out in India I tried to vaccinate myself for three successive years and

failed each time, which showed I was in a condition of immunity for that period. On the fourth year my general health was below par, and Colonel King, the Sanitary Commissioner of Madras, sent round some lanoline calf-lymph to be tried by civil surgeons as to its efficacy and relative value, as compared with other lymph used previously. The parents of the children in the school where I wished to introduce it, had to be consulted before trying this new lymph which came in little boxes instead of tubes, and so one had to be careful to give no cause for suspicion or complaint as people soon note the difference and ask questions in a country such as India. In order, therefore, to satisfy the parents as to the goodness of the new lymph and of its being beyond suspicion, I vaccinated myself first, in the calf of my leg, little expecting a good result, as I had failed in previous years with tube lymph; but to my utter astonishment, the vesicles appeared on the eighth day while I was out doing my inspections of villages which compelled me to abandon my marches on horseback, and I had to take to a bullock cart which I had for my children as it was most painful to move the leg, and worse to ride. The vesicle was perfect and most typical. The parents then allowed their children to be done, as they saw I was still alive and well after it. This was a very practical test I am sure.

We have the words of one, who so far back as 1767 uttered before the Royal College of Physicians the truth in so many words as to small-pox appearing every seven years in epidemic form, namely, Holwell. It is, therefore, to my mind clear from my own personal experience in India, and from what one knows of the history of small-pox and of vaccination, that unless protection from small-pox is secured by either a mild or severe attack of the disease, or that natural or acquired immunity which some enjoy through the channel mentioned, vaccination and re-vaccination, as I shall show, is the best, surest, and mildest safeguard against future epidemics for the practice of inoculation is *dangerous* and *wrong*. We have not arrived at that stage of knowledge in bacteriological or physiognomical diagnosis of diseases which enables us most unmistakably to certify, that such and such a person or child by mere examination of the blood, or from appearance merely, can be declared to be certainly immune against small-pox; but when we see objectively the typical marks or pitting with small-pox, or vaccination and re-vaccination, we can affirm that there is every hope of an immunity or protection having been secured, either permanently or temporarily, unless we err in mistaking the pitting of chicken-pox for small-pox, or a circular scar on the arm for a vaccination scar. It is, therefore, our bounden duty to be clear in our diagnosis, and in case of doubt to vaccinate or re-vaccinate. Let us hope that a time will arrive when our anti-vaccination friends are able to assist us by such perfect diagnostic signs of immunity present, and until then, we, as advocates of our science and art, must hold our ground firmly, shoulder to shoulder, on the objective truths which have been clearly proved since the days of Jenner up to the present.

The testimony of an ancient people such as the Hindoos, whose homes were desolated in the past with such severe small-pox epidemics, compelled them to believe that an attack of small-pox conferred immunity or protection from future attacks, and thus the introduction of inoculation came as a matter of experience which induced a mild attack by taking the virus from the body of a person who had suffered mildly at an intervening period (and not at an epidemic period), which virus was therefore attenuated, because the disease was dying out gradually and naturally, and becoming milder and milder each year. Such an inoculation of the attenuated human virus induced a crop of 50 to 200 pustules, but they were scattered and not confluent, because the original attack was not so grave. Have not the methods of Pasteur and others in the field of bacteriological research been an attenuation of the virus through animals instead of human beings? The arm to arm vaccination which has been abandoned in this country; but still kept up in many parts of India, though decried, has its advantages and disadvantages, but the lymph from tubes has been proved to be safer if certain precautions be exercised. But apart from the relative value of the arm to arm method, and that from the calf (either direct or from tubes of lymph) there is sufficient evidence from our own experience of the Hindoos, that inoculation from mild epidemics of small-pox, and vaccination with re-vaccination every five or six years, lessens the chances of a severe epidemic of small-pox; while on the other hand, inoculation possesses a dangerous element in practice in the hands of the ignorant who cannot distinguish a severe from a mild, or a discrete from a confluent case, hence the chances of creating an epidemic of small-pox. This element of danger does not exist in vaccination and re-vaccination, nor has it ever been proved that the latter practice has created a small-pox epidemic, which the former certainly does create at times, and is open therefore to danger, so rather than run risks by encouraging inoculation there has been legislation in the matter against such a practice, and which legislation I am sure, we all heartily uphold and desire to see carried out most vigorously in the interests of the public.

At this point, I feel it would be of great interest to some present to know, that although inoculation for small-pox is wrong and has been legislated against in India, yet there are certain parts of the country where it is still carried into practice to this day in remote villages. The virus is taken in quite a haphazard fashion from a person suffering from either small-pox (in a confluent or other form) and even in some cases from a child with chicken-pox (when it is useless) and passed into the wrist at the root of the thumb or the extensor surface of the forearm between the lower and middle third, or into the upper arm. As a rule one large scar is left, about the size of a two-shilling piece.

Here I feel it my duty to mention my experience in the work of vaccination as a sanitary and health officer of a district in India, namely, Sibsagar, in Assam, where I was Civil surgeon, and where I found inoculation for small-pox had prevailed, and was still prevailing. Sibsagar District is in the Upper Assam Valley, with a population of 457,274 souls, and is important from a commercial aspect because of the

1st Row (Top): S. Subruhmanyan. J. C. Ryan. A. C. Rendle. A. J. T. Swann. E. M. Nicholl. R. Cope. E. R. Whitmore (U.S. Army). A. R. Rendle. A. A. Mackie. A. L. Wykham. L. Sells. A. J. Craigern. H. L. Burgess. H. A. Haviland.

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Absent: J. D. Finlay. G. A. Rademaker.

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tea trade and a large community of Europeans, there being 163 tea gardens with an enormous imported native labour force present, and which labour force is chiefly imported from the congested districts of Bengal, Behar, and the Central provinces.

The name Sibsagar comes from "Siva" or "Sivu" the destroyer (one of the gods of the Hindu Trinity) and "Sagar" which means ocean. The district is the ancient capital of Assam, on the banks of the great Brahmapootra River the largest river in India, which takes its origin from a mere trickle in the Himalayan range beyond Darjeeling, and in the heart of Thibet. Brahmapootra, means the country of Brahma, the great Brahm of the Hindoo religion.

Sibsagar district boasts of several ancient temples scattered in various parts, and also of large tanks or lakes, artificially constructed by the Ahôm Rajahs, with great skill. Doubtless these people living in the country presided over by Siva the destroyer, felt in the midst of great epidemics of small-pox, the dire need of a purer water supply than they possessed, and so these tanks, some of which are half a mile square (as in Sibsagar town in the centre of a European population) and are kept at the present time as the drinking water supplies by the municipal bodies. Their necessity is evident, and the good they do is absolutely proved, for there are three municipalities in the district, namely, Sibsâgar, Jorhât, and Golaghât, and whilst the two former have such water supplies as are pure the last place has not, but chiefly depends for its supply on surface drainage from the rice-fields, and there is a very heavy mortality as the consequence when compared with the two former.

The Civil surgeon of the district is also sanitary and health officer, and among several hospitals, a jail, and two lock-ups, and the sanitary inspection and vaccination of the rural circles and municipalities above mentioned, he has to visit tea gardens which are placed on the "black list," because the labour forces have a mortality of 7 per cent. or over, from all causes present. Out of these 163 tea gardens, as a rule, about 25 to 40 are annually on what is known as the "black list," through defects in their sanitary arrangements and hygiene which have to be reported to the government twice a year in some cases, and once a year in others, when they are known as first and second class gardens. These tea gardens have a European medical practitioner, and a staff of native doctors and vaccinators of their own, there being as a rule one European in medical charge of six to twelve gardens or more, whose returns of birth-rate and mortality are submitted through the civil authorities to the Civil surgeon, and then to the Government; the vaccination and sanitation though done by their respective staffs come under the general supervision of the Civil surgeon who is practically a Chief medical officer. The labour force of the gardens in Sibsagar comprise one-fifth of the total population of 457,274 souls, and the balance therefore are under the immediate eye of the health officer, who is Sanitary officer and Civil surgeon. For this great work under his care with a large amount of office work and returns submitted weekly, he earns his pay in so many rupees from the Government; and if called in by private patients he is allowed to treat them; but his fees have been fixed by the paternal authorities, who can move the wheels along smoothly or roughly as it pleases them. I mention this because so few do really realise the heavy responsibilities we have, and practically we do our duty to check epidemic disease from reaching the West.

The native staff under the Civil surgeon comprise six hospital assistants for each of the hospitals under his charge, one native superintendent of vaccination, while the hospital assistant is also superintendent of vaccination within the area of each of the three municipal towns above named, twenty-four rural vaccinators, three municipal vaccinators. There are, as a rule, one dresser and compounder to each hospital, one clerk to the Civil surgeon's office, and the menial establishments of cooks, chowkidar or porter, and sweeper.

In addition to the above duties, the Civil surgeon is also examiner, or rather president and examiner of the Examination Board for passing the native doctor class of the tea gardens in his district.

The vaccination of a large district with an enormous labour force in the tea gardens, of which Sibsagar has 163 small and large gardens, means a proper organisation if epidemic small-pox is to be kept in check, and the cause of the outbreak traced to its proper source and dealt with locally.

The plan concerted by me for carrying on this work efficiently, was as follows, and this was specially due to prevent the *ingress* as well as *egress* of small-pox, in, or out of the district.

Each of the large municipal areas (Sibsagar, Jorhat, and Golaghat) had a native hospital assistant in charge of the dispensary, who was also superintendent of vaccination for his sub-division, but responsible to the Civil surgeon at the headquarters of the district. To each of the vaccinators, municipal as well as rural, I gave at the commencement of the work of vaccination, a sectional map of the district made out on wax-paper, with about twenty-five villages on each map. These villages were to be inspected by the municipal vaccinators from the centre to the periphery in successive circles by rotation, and that circle was not to be given up till the vaccination and inspection was fully completed. The rural vaccinators were to visit the villages at the boundary of the district in semi-circles towards the centre, until they met and joined hands with the municipal vaccinators, when, if there were time (as vaccination is only done from October to April 15th), they now worked in the reverse order, *i.e.*, municipal vaccinators to the centre, and rural vaccinators back to the periphery vaccinating all newly-born children over six weeks old. The object of such a plan is evident, for in a district where the labour forces of the tea gardens were immigrants from the congested areas of India, our desire was to fix the responsibility on the right quarter, or source, whence an epidemic of small-pox arose, since there was an indigenous population who were comparatively clean, and naturally one wished to be fair to them.

What I wished to ascertain were the following points:—

(1) Whether small-pox was *imported* from without chiefly by immigrants, or endemic; or was due to the practice of *inoculation* among the indigenous population?

(2) Whether the figures for primary and re-vaccination in past years were to be relied upon, and whether it was possible to have 40,000 vaccinations to be done annually in this district for several years together?

(3) Whether it was possible in a district where vaccination and re-vaccination had been carried out as stated vigorously for thirty years or more, to have epidemics of small-pox breaking out through the usual channel of conveyance by the traffic routes of human intercourse between Assam and India?

(4) Whether small-pox and chicken-pox had not been confused at times?

To do this and get to the source, I had weekly returns sent in from vaccinators in both areas, *i.e.*, rural and municipal, first to the native superintendents who checked them, and then sent them to me as health officer. This enabled me to go to any village and inspect the adult and infant population, and thus note how many were already protected from small-pox by having had a previous attack, or through being vaccinated and re-vaccinated efficiently; and also how many had been inoculated? and this could be done at any time during my rounds, since the head-man of every village has a small parchment book containing the birth-rate and mortality of a village, with the births and deaths noted, and it is supposed to be up to date. All this entailed labour, but it was well worth the trouble in order to arrive at the solution of the difficulties I was entrusted with by the government, and also to check the practice of inoculation among a people who were of the best of intentions, but ignorant about the value of vaccination.

Such a plan was considered very necessary, since I found from the annual returns of past years, as well as from the medical-history of the district, and from personal observation, that there were small-pox epidemics of a grave character from time to time, and I wished to find out the responsible agents for the good of the whole community as well as for the good of the tea industry.

It indicated, moreover, (1) that the figures for primary and re-vaccination in past years might be open to serious criticism; (2) That the practice of re-vaccination was not resorted to in all suitable cases; (3) That inoculation might be responsible for small-pox epidemics; and since the government considered it as an illegal measure, my clear duty was at all risks to check it, and so I determined on the correct plan of operating for the health of the whole district and community, and the plan I am glad to say has borne fruit since.

I found after the work was started, that it was impossible in a district with the birth-rate so low and a high mortality; and with a population who through epidemics of small-pox in previous years had 50 per cent. of their number pitted with small-pox; and also where vaccination had been vigorously carried on, as stated in the returns for years together to have so large a return as 40,000 primary vaccinations annually which I was expected to keep up and increase if possible. I was able to prove my point that it was impossible, at any village on the spot, that vaccination and re-vaccination had not been properly done, but inoculation practised. Now, how was this effected?

In the municipal areas, I found from the reports of my superintendents, that the work was very irregularly done, for, when a vaccinator was supposed to be working at such and such a village on his map and from his returns of the previous week, when the superintendent went down unawares to inspect his work, he was absent and at his home. Moreover, that each mark on one arm was described on the register as a vaccination of a patient; hence, for every *one* patient done, *four* marks were represented in the register as *four* patients. One vaccinator vaccinated about forty patients in one day only with four marks each, and rested at his home for twenty-nine days in the month, showing 160 operations per mensem. The same occurred in the rural areas. As for re-vaccination being undertaken, it was hardly ever done. This mere show of reports on paper, was practically discouraging vaccination and encouraging inoculation, and the government salary was a mere nominal one.

Now, as to inoculation, I was informed one fine day by my superintendent, that in one particular part of the rural areas, inoculation was being largely carried out. I told him we must check it as it was contrary to the wishes of the "Sircar" (government). He said, "Sir, if you go near the village the men will come round with 'lathis' (cudgels)." I said, "Well, we must then get the help of the police if such is resorted to, but our duty is clear." We went down to the spot which was reported to have 8,000 people unprotected from small-pox. On arrival a crowd assembled, and I asked for the headman of the village. A man with great dignity, clad in white, came along the village path, and I met him half-way to show that I was willing to meet him in his arguments if he had any. He had two cane chairs brought out as the first modicum of friendliness and a chat on friendly terms, and had them placed under the shade of an orange grove, which was certainly pleasant, and asked me to be seated. I told him I had been so long in my saddle that morning that it was a relief to stand, and I also beckoned him to be seated as he was a priest. He then asked me what I would like to see him about? I said, only to ask if vaccination or inoculation was more acceptable to his people, as the one saved from small-pox, the other gave small-pox. He said that he preferred the latter, as he found from the experience of past years that it was more effectual than vaccination, for when vaccination was performed he often found that children got small-pox after a time, and some died, whilst in inoculation never gave all this trouble. It was done "once and for all." He certainly belonged to a very candid order of anti-vaccinationists one does not often encounter.

I then informed him that vaccination was not supposed to protect children for a lifetime, but it did for a certain number of years, and had to be repeated, and that was the order of the Government. Moreover, there was another disease called chicken-pox which might attack a child soon after being vaccinated, and another disease called measles, which also might attack a child in the same manner and the child might die, but that these two diseases had nothing in connection with small-pox or vaccination, and were distinct diseases; but that chicken-pox was a mild disease, and in some respects resembled small-pox;

that measles was not so mild, and sometimes proved very destructive to life. Our measures were against small-pox and not the other two.

I also informed him that I noticed about 50 per cent. of his rural population in a great many villages had marks of small-pox which could have been prevented if vaccination and re-vaccination had been properly done in past years; and as the Government did not want small-pox nor inoculation, I was obliged to do my duty, and had come to explain matters and nothing else, and I hoped he would let me. (The old gentleman shook his head all the while.) I was prepared to do my duty by vaccination, as ordered, and if he preferred inoculation I would be obliged to report this fact, and to also state that it was the cause in many instances of importing small-pox and creating an epidemic, and as we had had several epidemics it was time to put a stop to inoculation as it had had a fair trial.

The priestly gentleman said he was quite ignorant of all this, and I said I felt sure he was; but as to the pitting with small-pox, he said, that "it was the will of 'Matadevi'" (their god). I said, "Well, the Government would make every allowance for his ignorance in the past, but not now that he was more enlightened on the subject of the differences between small-pox, chicken-pox, and measles, and the part each played."

(*To be continued.*)

Bilharzia Hæmatobium.

Among the Boers and the South African natives brought to America during the St. Louis Exhibition seven were found suffering from bilharzia.

Anchylostomiasis (Uncinariasis).

Claude A. Smith (*American Medicine*, October 14th, 1905) reports that he has experimentally confirmed the transmission of uncinariasis infection by way of the skin as originally stated by Looss in Egypt.

Cholera.

Poland.—From October 5th to 11th the fresh cases of cholera reported numbered 47, and the deaths from disease 24.

Austria.—In Galicia, in the province adjoining the Russian frontier, four cases of cholera were reported on September 18th, of which three proved fatal.

Yellow Fever.

New Orleans.—With the advent of cold weather, cases of yellow fever are diminishing. On October 15th the number of fresh cases reported were eight only, the lowest number since the first outbreak of the present epidemic. The fall has been as follows:—

October 1st to 5th . .	...	122 fresh cases
October 6th to 10th	...	108 ,,
October 11th to 15th	...	84 ,,

Panama.—Yellow fever has well nigh completely disappeared from Panama.

Lima, Peru.—Yellow fever cases were reported in Lima during September.

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THE

Journal of Tropical Medicine

NOVEMBER 15, 1905.

THE INTERNATIONAL CODE OF ZOOLOGICAL NOMENCLATURE AS APPLIED TO MEDICINE.

IN an excellent pamphlet Ch. Wardell Stiles, Ph.D., gives an account of the present International Rules of Zoological Nomenclature. The necessity for adopting some form of common International Code for all groups and for all countries has long been recognised, but it was left to the far-seeing judgment of Professor Raphael Blanchard, of Paris, to bring forward a satisfactory basis on which such a code could be established. Blanchard's proposal was adopted by the first (1889, Paris) and second (1892, Moscow) International Zoological Congresses, but it was not until the sixth congress (1904, Berne) that a sub-committee consisting of Professor Blanchard, Professor von Maehrenthal and Ch. Wardell Stiles presented the completed rules which now obtain. A permanent commission of fifteen zoologists now exists, as a deliberative

and advisory body, with Professor Blanchard as president and Professor von Maehrenthal and Dr. Stiles as secretaries, whose duty it is to protect the Code from the introduction of any revolutionary and ill-advised changes. Although neither the commission nor the congress has any power to force zoologists to adopt the International rules, there is a growing tendency to adopt the Code in order to prevent nomenclature becoming a complicated chaos of words. How necessary it is to have nomenclature regulated may be gathered from the fact that Ludwig in 1886 estimated that there were 312,015 known species of animals. This moderate estimate was exceeded by Ashmead in 1895 and by Howard in 1905, the latter calculating the total number of known and unknown species of insects alone to be between 3,500,000 and 4,000,000. Between 1880 and 1900 Waterhouse estimates that about 1,150 new generic and supergeneric zoological names were proposed annually. The necessity for some scientific basis of nomenclature is therefore abundantly evident.

Of the many articles of the Code several should be carefully studied by medical men resident in tropical countries, for to them occur opportunities of collecting and studying zoological specimens new to science. Article 2 of the Code states that the scientific designation of animals is uninominal for subgenera and all higher groups, binominal for species, and trinominal for subspecies. As Stiles explains, one of these names the generic name (corresponding to the family name or surname of persons), the other the specific name (corresponding to the Christian name of persons). Thus man as a systematic unit is known as *Homo sapiens*—*Homo* being the family name, say Smith, *Sapiens* being the specific name, say John. When a subspecies has to be indicated a third name is added; thus we have *Sus scrofa domestica*, the generic, specific and subspecific titles, meant to distinguish the domesticated hog from the *Sus scrofa*—the wild boar. Article 3 rules that the scientific names of animals must be words which are either Latin or Latinised. Article 4 states that the name of a family is formed by adding the ending *idæ*, and the name of a subfamily by adding *inæ* to the root of the name of its type-genus. In all cases the name of the type-genus is taken as the basis of the nomenclature and the endings *idæ* and *inæ* are added to the root of the generic name in question. Thus the tapeworms (*Tænia*) in man are classified as: Family *Tæniidæ;* Subfamily *Tæniinæ;* Genera *Tænia* and *Echinococcus;* the other subfamilies of this *Tæniidæ* are similarly indicated.

Article 8 requires that a generic name must consist of a single word, simple or compound, written with a capital initial letter and employed as a substantive in the nominative singular; and Article 13 has it that while specific substantive names derived from names of persons may be written with a capital initial letter, all other specific names are to be written with a small initial letter. Thus we may have *Rhizostoma Cuvieri* or *Rhizostoma cuvieri*, but for other than persons' names the species is always written with a small initial, as *Tænia lata.*

In the appendix it is noted that the proposition of every new systematic group should be accompanied by a diagnosis in English, French, German, Italian or Latin, and should state in what museum the type specimen has been deposited, and should give the museum number of said specimen.

The metric system of weights and measures and the centigrade thermometric scale are to be adopted as standard, and the micron (0·001 mm.) written μ is adopted as the unit of measure in microscopic work. The indication of enlargement or of reduction should be expressed in figures rather than by mentioning the system of lenses used.

Enlargement or reduction of an object is indicated usually by linear measurement; the multiplication sign being used for enlargement and the fraction for reduction; thus $\times$ 50 indicates that the object is enlarged 50 times, $\frac{1}{50}$ indicates that it is reduced to $\frac{1}{50}$ original dimensions. When it is desired *to specify* the enlargement is linear, the sign $\times 50^1$ is employed, when surface enlargement has to be indicated the sign $\times 50^2$ is used, and $\times 50^3$ when general enlargement is meant.

These are but a few of the provisions drawn

up by the commission entrusted with the International Code of Zoological Nomenclature as applied to Medicine, and the medical profession has to thank Dr. Stiles for his clear exposition of the details of a complicated subject.

Notes and News.

RISKS TO HEALTH IN THE TROPICS.—A lecture is to be delivered in the Anatomical Theatre, Cambridge, by Charles F. Harford, M.A., M.D., Principal of Livingstone College, on "Risks to Health in the Tropics." Dr. Harford is to deal with the subject in regard to its relation to Imperial expansion and missionary enterprise, and will bring forward a plea for reform. The lecture will be fully illustrated by lantern views. The Master of Trinity will occupy the chair.

DR. H. A. D. JOWETT has been transferred from the chemical research to the experimental department at the works of Messrs. Burroughs Wellcome and Co., Dartford, Kent.

INOCULATION AGAINST PLAGUE AT BELGAUM, INDIA.—The difficulties of fighting plague in India can only be understood by those who are acquainted with the life, opinions, and prejudices of the natives. It seems a simple thing to formulate regulations, but it is a very different thing to get them enforced. Neither public nor personal explanations can budge the ignorant native from the belief that all sanitary measures against plague are designed by the Government for the purpose of reducing the numbers of the population, or that they are carried out for a salutary purpose. It seems a simple thing to legislate against rats and to promise rewards for their destruction, but when the rat is considered sacred to a god it is a difficult matter to enforce the ruling.

Review.

REPORT ON PLAGUE IN CALCUTTA FOR THE YEAR ENDING JUNE 30TH, 1904.

The Municipal Department of the Government of Bengal has just published the Report on Plague in Calcutta for the twelve months ended June 30th, 1904. The report is presented by T. Frederick Pearse, M.D., F.R.C.S., D.P.H., officiating Special Health Officer of Calcutta, with appendices by W. C. Hossack, M.D., and H. M. Crake, M.B.

This important document seems to have been considerably delayed in reaching us. Where the delay occurred it is difficult to ascertain, for Dr. Pearse's report was submitted as long ago as July 12th, 1904, to the Corporation of Calcutta.

The outbreak of plague in Calcutta has been kept well in hand ever since its first appearance in the city, and at no time has the disease prevailed to the terrible extent observed in several other cities and districts of India. As time passes and experience increases the nature and epidemiology of plague becomes more clear, and the steady work and continued observation of the capable medical men on plague duty in Calcutta bid fair to elucidate many points which still remain obscure. The present report deals principally with the following points :—

(1) *The Seasonal Recurrences of an Active Period and of a Quiescent Period in Plague.*—Year after year the quiescent and active periods of plague ebb and flow with a regularity that borders on mathematical exactness. In this connection we can understand the ancients attributing influences, to solar, lunar, tidal, astronomical, or other influences, in their attempts to find an explanation for the appearance of certain ailments at certain seasons; for with the regularity of the rising and setting of the sun do the seasonal variations of plague recur.

For the half-year ended December 31st, 1903—the "quiescent" period—the deaths from plague generally numbered under 20, and never over 30 per week; for the half-year ended June 30th—the "active" period—the cases reported exceeded 50 per week. The exact period of the severe outbreak was from the sixth to the twenty-third week of 1904, when during these eighteen weeks 4,354 deaths from plague occurred out of a total, for the twelve months ended June 30th, 1904, of 4,909 deaths from the disease.

The second week of April, 1904, showed the highest number for any week during the twelve months; and although the outbreak of 1904 apparently developed a little later, and was less severe than during the three previous recurrences, the climax and the decline of the outbreak occurred at the same periods as in past years almost to a day. The dates, therefore, of activity and quiescence for the year in question correspond almost exactly with those of previous years, and this observation of seasonal recurrence and constancy in plague holds good not only in Calcutta but in every part of India, and in almost every country where plague has occurred in recent years.

(2) *Rat Mortality and Plague.*—In the wards of the city in which the cases of plague increased in numbers during the second week of February, 1904, at which period the outbreak began, the rat mortality suddenly increased and advanced *pari passu* with the cases of plague in human beings. With the decline of the disease in man the mortality in rats also lessened.

(3) *No Definite Focus of the Disease in Calcutta.*—It has been observed that neither during the quiescent period nor when the outbreak of activity is commencing is there any particular focus or centre from which the disease spread. The infection seems to remain general, and it cannot be said that the infection remained in certain places only. There is no evidence to indicate that when infection became wide-

spread it was due to human intercourse, for, as during the quiescent period the cases of plague appeared in a sporadic fashion, so during the outbreak the number of sporadic cases would merely seem to have multiplied, the numbers in every infected ward of the city increasing simultaneously.

(4) *Buboes.* — Accumulated experience seems to show that the presence of buboes in cases of plague is a feature of the disease during the period of active outbreak; during the quiescent period buboes are rarely met with. The absence of buboes in plague is apt to lead to confusion in diagnosis. Although notification of deaths in India is compulsory, the nature of the ailment that caused death is usually ascertained (guessed) by the description of the signs and symptoms given by the relatives. As these descriptions are at all times vague, and in many instances misleading, even approximate accuracy is impossible. Without buboes, plague is practically unrecognisable by the uneducated, and the municipal or Government authority to whom the signs and symptoms are related is apt to put down to plague all rapidly fatal illnesses attended by fever. To such an extent is this the case that Dr. W. C. Hossack, in his very excellent report, contained in Appendix B of the Report, remarks that during the quiescent period, owing to "over-reporting," many more cases of plague are reported than actually occur. Dr. Hossack writes: "In fact, it seems to me that for a period of two or three months the city is practically free from plague."

In the Report *pestis ambulans* is discussed in relation to true plague and to *pestis minor*. The writer regards *pestis ambulans* and *pestis minor* as synonymous terms, and considers them as sometimes used to indicate mild cases of true plague. That *pestis ambulans* is by its very name to be thus regarded is only right, but that *pestis minor* is the same disease as either true plague or *pestis ambulans* is more than doubtful.

There is much in this Report to interest and instruct. Dr. Pearse's able condensation of the enormous amount of detailed information to hand, Dr. Crake's admirable description in Appendix A of the work done in the No. 1 District of Calcutta, and Dr. Hossack's closely reasoned arguments in Appendix B, by which he arrives at logical and usefu conclusions, are all of a high order of work.

The "Martin" Poison Bottle.

The makers claim that the "Martin" Poison Bottle is readily distinguishable even in the dark, from the facts that it will not stand upright but lies on its side, and that a deep indentation behind the neck of the bottle gives it a unique and unmistakable feature during handling. There can be no doubt the "Martin" is the most readily distinguished poison bottle ever produced.

Geographical Distribution of Disease.

As information arrives we publish, under this heading, the principal diseases met with in tropical and sub-tropical countries, so that those interested in the Geographical Distribution of disease may have a means of gathering information concerning the prevalent ailments in different parts of the world.

Panama.

ISTHMIAN CANAL.

The report of W. C. Gorgas, Chief Sanitary Officer for the Isthmian Canal, states that during May of this year among the 8,700 persons employed on the isthmus, the daily sick average was 300, equivalent to a constantly sick-rate of 34 per thousand.

Yellow Fever. — During May 31 cases of yellow fever occurred, with 7 deaths. The spread of the disease to doctors and nurses has been wholly prevented by excluding mosquitoes from the wards. When the new water supply is introduced, the storage of water near the former will be prevented, and the mosquito-breeding places done away with. At Colon and along the canal zone "mosquito brigades" are kept constantly at work, fumigating houses, covering water-barrels with wire netting, cleaning and grading imperfect ditches, cutting and burning grass and shrubs near dwellings, oiling tanks, water-barrels and cesspools. The effect has been a remarkable reduction in the number of Stegomyia and other mosquitoes.

The diseases of a tropical nature and the deaths they caused in the canal zone of Panama during the month of May were as follows: Beri-beri deaths, 6; dysentery, 5; malarial fever, 6; pernicious fever, 3; yellow fever, 7. The deaths from malaria do not in any way indicate the prevalence of the disease, for no fewer than 364 malarial attacks are recorded; the types of malaria were æstivo-autumnal, double tertian, quartan, triple tertian, single tertian, and hæmoglobinuric.

New Drugs.

ANTIKITO.—The Antikito Syndicate, Ltd., 6 Great Portland Street, London, W., after an extensive trial of antikito cream in many climates, are extensively advertising their preparation. They are perfectly justified in doing so, for as a means of warding off mosquito bites antikito has no superior. Mosquito brigades in towns and villages will, no doubt, in time prevent the ailments due to mosquito bites by carefully and rigidly destroying the breeding places of the mosquito, but it is beyond our fondest hopes to conceive a time when all parts of the earth shall be so drained that swamps shall be no more and that the mosquito will be wholly eliminated. It is, therefore, well to look facts in the face and to

encourage in every way we can the prophylactic measures at hand, whether it be quinine taking or protection by mosquito nets. The Antikito Syndicate seems to have provided yet another efficient prophylaxis. The syndicate has been in existence since 1896 and they have been testing the virtues of their antikito cream, not by chemical analysis merely, but by supplying their preparation to travellers and residents in some of the districts of the earth where mosquitoes and the diseases they communicate are most rife. The testimonies they have obtained are incontestable, but should the efficacy of their antikito cream be even a partial protection against mosquitoes and other baneful insects they have given us what might prove to be a comfort to many a traveller and tropical resident whose life has been worried and harassed, and the health impaired by these scourges of the Tropics.

MESSRS. BURROUGHS WELLCOME AND CO.—COMPRESSED SURGICAL DRESSINGS.—We have been favoured with specimens of "tabloid" compressed boric cotton-wool, carbolised tow, boric gauze, gamgee tissue, bandages and sanitary towels put up by Messrs. Burroughs Wellcome and Co. The compactness and convenience of these products are remarkable. For travellers and for tropical residents the small space necessary for transmission of these dressings and appliances must prove an immense boon.

ERGOTOLE.—Messrs. Sharp and Dohme, Manufacturing Chemists, of Old Swan Lane, London, have drawn our attention to this useful form of ergot. Any preparation that can ensure the speedy and efficient action of ergot will be welcomed, for whether in the fluid or solid forms in which ergot is placed on the market, they are at least doubtful in their potency, especially when they have to be carried over sea and up country in tropical climates. Ergotole is put up in sterilised bottles of one ounce each. Each minim represents the complete therapeutic value of 2½ grains of crude ergot. Ergotole may be used hypodermically, and owing to its ascepticity and concentrated strength is especially valuable in cases of emergency. The agents for Ergotole are Messrs. Thomas Christy and Co., 4, Old Swan Lane, London, E.C. The cost of the one-ounce bottle is two shillings.

Chloride of Zinc as a Deodorant, Antiseptic and Germicide. By T. B. McClintic.

The conclusions arrived at after a careful and prolonged investigation of the various attributes claimed for chloride of zinc, undertaken by Mr. McClintic on behalf of the United States Government, are as follows:—

Zinc chloride has some properties as a deodorant to recommend it favourably, but its antiseptic and germicidal powers are comparatively feeble, these negative qualities combined, its cost and caustic properties, practically eliminate zinc chloride from the useful and reliable disinfectants.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Journal of the American Medical Association," September 16, 1905.

Symptoms, Diagnosis, and Prognosis of Uncomplicated Intestinal Amœbiasis in the Tropics.

Musgrave, W. E., discusses this subject from experiences gained in Manila, under (1) latent and marked infections; (2) mild and moderately severe infections; (3) severe cases, including gangrenous diphtheric cases; (4) infection in children and in the aged. The keynote of his contention is that dysenteric lesions are due to the presence of motile amœbæ in the intestines. In the latent form their presence do not give rise to the typical or classical symptoms of dysentery. In the latent stage abdominal pains, indigestion, headache, coated tongue, foul breath, loss of appetite and of weight, and some yellowness of the skin, with occasional attacks of diarrhœa, may alone obtain; yet is there danger to life without the disease passing on to the blood and mucous states of true dysentery with tenesmus, fever, and extreme lassitude. If during the latent stage a purge is administered, mucus with active amœbæ may be brought away. Musgrave wishes to emphasise the fact that intestinal amœbiasis (amœbic dysentery) manifests itself in a much broader and more comprehensive clinical picture than is generally admitted. He further contends that waiting for bloody mucous stools to appear before making a diagnosis is fraught with danger to the patient. The symptoms produced by the presence of active amœbæ in the intestine are in no way proportionate to the damage done to the bowel.

"Semaine Medicale," September 13, 1905.

Malaria as a Possible Cause of Acute Peritonitis.

Gillot, V., gives details of a case of peritonitis in a patient in whom the malaria hæmatozoa were found in the blood. The symptoms disappeared when quinine was administered.

"Journal of the American Medical Association," October 14, 1905.

Entrance of Ankylostoma Larvæ by Way of the Skin.

Smith, Claude A., concludes from his experiments that infection in ankylomstomiasis (*uncinariasis*) can take place by way of the skin. He mixed a mass of fæces containing the eggs of the parasite with moistened sterile earth. In twenty-four hours when the eggs hatched and larvæ presented the mass was placed on the wrist of the subject experimented upon and allowed to remain for one hour. This proceeding was

repeated daily for five days, and only on the sixth application did the patient complain of local sensation. The skin became red and itching, the part swelled and large blebs appeared. By the middle of the sixth week after the soil was placed on the wrist ankylostoma eggs were found in the fæces of the subject experimented upon. The number of eggs increased in numbers during eight weeks, when thymol was administered.

Apparatus, &c.

Mosquito Boots.

Messrs. George Morris, 55 and 56, Bishopsgate Street Within, London, E.C., have submitted to our notice a boot intended to be worn as a prophylactic measure against mosquitoes biting the ankles and the feet. The boot is light and efficient, and will no doubt soon be included amongst the baggaged equipment requisite for travellers and residents in tropical countries. The patent hempen sole of the boots ensures coolness and also lightness for carriage and wear. The most common time of day to be bitten by mosquitoes is during the dinner hour, when the mosquitoes alight on the ankles, especially in the case of women. Some persons wear two pairs of stockings to prevent the mosquito biting, but the mosquito boot is much more effectual.

Philippines.

Manila health report for June, 1905 :—

Population	219,941
Birth-rate	32·26
Death-rate...	32·81

Chief causes of death, June, 1905 :—

Typhoid fever	13
Intermittent fever	5
Malarial cachexia	2
Small-pox	1
Whooping cough	2
Dysentery	31
Bubonic plague	6
Leprosy	4
Other epidemic diseases	21
Tuberculosis	91
Cancer and other malignant tumours...	4
Meningitis	27
Convulsions (under five)	103

Plague.

Peru.—The Plague Hospital in Mollando was closed on June 25th. The total number of cases treated was 125. Of these 49 died. Yersin's serum was freely used.

AWARDS AT LIÈGE INTERNATIONAL EXHIBITION.

The International Jury of the Liége Exhibition have conferred upon Burroughs Wellcome and Co. six Grand Prizes, three Diplomas of Honour, and three Gold Medals for the scientific excellence of their products, including

(1) "Wellcome" Brand Chemicals.
(2) "Tabloid" and "Soloid" Brand Products.
(3) "Kepler" Preparations.
(4) "Tabloid" Brand Photographic Chemicals.
(5) "Hazeline" Preparations,
(6) Pleated Compressed Surgical Dressings.
(7) "Tabloid" Brand Medical Equipments, &c.

EXCHANGES.

Annali di Medicina Navale. Annali d' Igiene Sperimentale Archiv für Schiffs u. Tropen Hygiene. Archives de Médicine Navale. Archives Russes de Pathologie, de Médec. Clinique et de Bacteriologie. Australasian Medical Gazette. Boletin de Medicina Naval. Boston Medical and Surgical Journal. Bristol Medico-Chirurgical Journal. British and Colonial Druggist. British Journal of Dermatology. British Medical Journal. Brooklyn Medical Journal. Caducée. Climate. Clinical Journal. Clinical Review. Giornale Medico del R. Esercito. Hong Kong Telegraph. Il Policlinico. Indian Medical Gazette. Indian Medical Record. Indian Public Health. Interstate Medical Journal. Jahresbericht. Janus. Journal of the Royal Army Medical Corps. Journal of Balneology and Climatology. Journal of Laryngology and Otology. Journal of the American Medical Association. La Grèce Médicale. Lancet. Liverpool Medico-Chirurgical Journal. Medical Brief. Medical Missionary Journal. Medical Record. Medical Review. Merck's Archives. New York Medical Journal. New York Post-Graduate. Pacific Medical Journal. Polyclinic. Public Health. Revista de Medicina Tropical. Revista Medica de S. Paulo. Sei-i-Kwai Medical Journal. The Hospital. The Northumberland and Durham Medical Journal. Transactions of the American Microscopical Society. Treatment. West India Committee Circular. West Africa.

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Notices to Correspondents.

1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the Journal of Tropical Medicine should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communications.

A NEW PROCESS FOR THE MICROSCOPIC DIAGNOSIS OF THE TINEA IMBRICATA.

By Ulysses Paranhos, M.D.

Physician to the Charity Hospital, and Assistant at the Pasteur Institute, of Sao Paulo, Brazil.

Tinea imbricata is a dermatosis produced by the *Aspergillus lepidophyton*.

It can be confounded with several other diseases of the skin, such as herpes circinatus, pityriasis roseus of Gilbert in its beginning, pityriasis marginatus, of Vidal, eczema sebaceus, and all the trycophiciæ.

The safest way to obtain the differential diagnosis is the microscopic trial made on *scales* from a contaminated individual.

By this trial the mycelial filaments of the *Aspergillus lepidophyton* can be observed with its segmented protoplasma, but rarely are the club filaments to be seen. It is only exceptionally that one can observe the typical aspergillus terminations described by Werner—mycelia of 1 to 2 μ thick, with ramifications uncoloured, and separated by segments.

The classical process for the microscopic trial of the tinea imbricata is the following: Immersion in alcohol ether, or a solution of potassium at 4 per cent., and colouring with a chromatic derivative of aniline, which differs according to authors.

After having multiplied the experiments, we succeeded getting a rapid microscopic process for the diagnosis of the tinea imbricata, which gave us results much neater and purer than all the other tests obtained by toluidine blue (Jeanselme), eosinated alcohol (Besson), nesuvine (Triboudean), and saponine (F. Noe).

The following are the technics of our method:—

(1) Bathe the suspected *scale* in essence of wintergreen during five minutes in a tube of essay.

(2) Proceed likewise, using the same method with *Roux-mixture*, absolute alcohol, and ether in equal parts.

(3) Place the scale in the following solution and during ten minutes:—

Common ammonia...	30 cc.
Distilled water	100 cc.

(4) Spread the *scale*, after dissociation, in the ammoniacal solution by means of a little glass rod on a lamel, fix it *a calore* and colour it with the infrachromatic mixture, and during ten minutes *a frigore*, having beforehand washed the preparations with distilled water.

Aniline blue (E. Merk)	1 gram.
Carbonated lithine	2 grams.
Distilled water	150 cc.

Mix up these different ingredients by shaking the liquid well; warm it in a water-bath (Bain Marie) during a quarter of an hour, keep in a bottle with emery cork during three days and in a stove at 37° C.

Correct the reaction to a weak alkalinity with a solution of acetic acid at 5 per 100, filter, and use it.

(5) The colouration being thus obtained, wash the lamel in a current water, dry it up with filter paper, treat it with neutral cedar oil, and observe it with an immersion objective.

Employing this method, which does not last more than a few minutes, one can obtain remarkable preparations with great neatness even when the parasites are not very numerous.

ON EUCALYPTUS OIL AS A VERMIFUGE IN ANKYLOSTOMIASIS.

By Llewellyn Powell Phillips, M.A., M.D., B.C., F.R.G.S., M.R.C.P.

Physician, Kasr-el-Ainy Hospital, Cairo, and Professor of Clinical Medicine, Egyptian Government Medical School.

In the summer of this year (1905), four male pigmies were admitted into Kasr-el-Ainy Hospital under my care for treatment, as they were found to be harbouring ankylostomata. They were somewhat anæmic, and three of them had enlarged spleens. I proceeded to treat them in the usual way with thymol, though not quite in the full doses on account of their small size, and the age of the smallest. The result of the thymol treatment was not good, as only two male ankylostomata were expelled from the four. Dr. Looss, the Helminthologist to the School, then drew my attention to a method of treatment described by Dr. Hermann, of Mons, in Belgium, as employed by him in the treatment of ankylostomiasis in miners, in which eucalyptus oil acted with the assistance of chloroform as a vermifuge. I accordingly tried it upon them, with the result that the first administration yielded 150 worms, and the second thirty more; they unfortunately left for England before a third dose could be given. After this striking result I determined to try the method in other cases, and during the summer I employed it at the hospital, not only on my own cases, but also on those of my colleague during his absence on leave.

Our previous routine method was as follows: After the patient had fasted during the day a gram of thymol was given him in cachet in the evening; the next morning the dose was repeated, and followed by a purge. But often the drug produced great depression of the heart, with slowing of the pulse, and artificial stimulation in the form of strychnine and strong coffee had to be resorted to, and fatal results had even occurred. The patients on thymol were, therefore, always a source of anxiety to the sister in charge and to the hospital orderlies, and much time was wasted in watching them. A safer method was, therefore, much to be desired.

The treatment now described fulfils, in my opinion, this requirement, and has been followed, when properly carried out, by very good results. I do not, however, consider it absolutely perfect, as there are *occasional* failures; but I am certain that it is more successful than thymol is, in such doses as can be given in safety.

Dr. Hermann described in his paper several methods of treatment with thymol, filix mas and eucalyptus, but concluded that the latter drug was the most successful; his formula was as follows:—

Eucalyptus oil	...	...	2·00 grams.
Chloroform	...	...	3·00 ,,
Castor oil	...	...	40·00 ,,

This formula I used at first, and then finding that no ill-effects were produced in many cases I increased the doses as follows:—

Eucalyptus oil	...	...	2·50 grams.
Chloroform	...	...	3·50 ,,
Castor oil	...	...	40·00 ,,

The following is the routine method employed by me now at Kasr-el-Ainy Hospital: About 6 p.m. the patient takes a saline purge (though this is not absolutely necessary, as for a long time I discarded it, though, perhaps, it is better not to omit it), and then fasts all night, and the next morning at seven takes half the above mixture; in half an hour's time he takes the other half; he is kept in bed, still fasting, until the bowels act. Should any depression occur after the first half of the drug, the second half is omitted. (This happened in the case of the youngest pigmy, who only took half the dose.) In young boys and feeble, anæmic patients the dose is divided into thirds, and given with twenty-minute intervals. The dose can be repeated every other day. This effects a considerable saving of time necessary for treatment.

As a rule, three to four liquid stools follow, though sometimes only one. Dr. Looss, who examined the stools in the earlier cases for me, told me that in the first stool there are no worms, and that in the first solid stool after the medicine has ceased acting there are also no worms. He found, further, that the worms are expelled alive; this may account for the absence of worms in the solid stools, as the worms may have time to recover and refix themselves.

Occasionally the first administration is not successful, though why I do not know, and again, very occasionally, after one or two negative results a few worms appear. This may be accounted for, in some instances, as Dr. Hermann suggests, by the fact that the worms having entered through the skin just before admission, not having reached the gut until after the lapse of some time, though in one case (which will be referred to again), a few days after an unsuccessful administration some worms were found *in situ* at the *post-mortem* examination.

The earlier cases were examined by Dr. Looss, but later I detailed a student, week by week, during the summer, to examine the stools. Unfortunately, however, owing to stress of work, on several occasions the stools were thrown away unexamined, and so the results are not quite so full as I should liked them to have been.

In forty-four cases it was wholly successful, as one or more further doses of the eucalyptus mixture yielded no more worms; in some, also, one or more doses of thymol were given with the same object and the same result. In twenty-one cases a single dose was sufficient, a single confirmatory dose of the eucalyptus mixture being given in fifteen, two extra doses in four, and in one, two doses of the mixture and two doses of thymol, with negative result. In four of this series thymol had been previously given before the eucalyptus was tried. In sixteen cases two administrations were sufficient, as confirmatory doses showed. In some of these, as already mentioned, the first dose was unsuccessful, and in several others the second dose expelled more than the first dose. In three cases three doses were necessary, and in four, four doses. One of these latter cases is very instructive. The first dose having expelled no worms, thymol was given twice with a negative result; he was then given eucalyptus five times; the first three of these expelled worms, whilst the last two doses yielded none.

In twenty-six other cases, including the pigmies, it was very efficient, but the patients left hospital before confirmatory doses were given; thus in one case, after seventy-six worms were expelled by the first dose, the patient insisted on going home. So whether these were completely cured or not is uncertain.

In the majority of cases, with the exception of a first administration, if a negative result was once obtained, further dosage expelled no more worms, except in the following instances. Salem Ismail, aged 20: the second dose expelled none, but the third expelled seventy-six and the fourth thirty-three, the fifth being negative. Ibrahim Said, aged 20: the fifth dose expelled none, but the sixth expelled six. Khalil Khalil Said Ahmed, aged 25, who was extremely weak and anæmic, took the eucalyptus mixture on July 22nd, with the result that forty-seven worms appeared; a further dose on the 26th expelled none. He died on the 29th, and twenty-one worms were found *post mortem*. (This case is not included with the successful cases above.)

In twenty-nine other cases the mixture was given in some for diagnosis and in some for treatment. In twenty-three no worms appeared; in five the stools were lost; in another thymol expelled two worms after two doses of eucalyptus had failed.

In three other cases the following results were obtained: In one, after the first dose of eucalyptus mixture, the stools were not examined, but a dose of thymol expelled thirteen worms; a second dose of eucalyptus yielded none. In another the first dose of eucalyptus expelled one worm, then thymol expelled four, and a further dose of eucalyptus five. In the third a dose of eucalyptus and a dose of thymol were unsuccessful, but a second dose of thymol expelled ten, and a dose of eucalyptus seven; a final dose gave a negative result.

The most successful cases were as follows: A first dose expelled 329 worms, a second none. In another the first dose expelled 270, in spite of previous dosage with thymol. In a third the first dose expelled 37, the second 300, the third none. In a fourth case the result of the first administration was not examined, but the second yielded 150, and two further doses none.

That the chloroform is essential is shown by the fact that in three cases where the ova were present chloroform water was given in error instead of chloroform, with a negative result.

Thus the treatment has been employed in 103 instances (the cases in which chloroform water was given being excepted), forty-four of which were entirely successful, in twenty-six efficient, in the other thirty-three either unknown or else negative, being employed in some for diagnosis, or else mixed treatment was adopted. In one, the patient who died, only partially successful.

I think, however, that it is obvious from a consideration of the above results that the treatment is satisfactory with reference to its vermifugal effects. Further, it is not unpleasant for the patient, the long fasting being unnecessary, and the taste of the mixture not offensive. It is cheaper, and repetition being possible three times a week, the stay in hospital is shortened. Lastly, the absence, or rather rareness, of cardiac depression as a result is a good feature. All these facts make it an advance in treatment.

As regards the dosage, if the patient be strong and fairly healthy, I give the larger dose, but if very young (twelve years of age, or so), or very weak, the smaller dose, given in thirds.

Oxyurides are freely expelled by it, and I have used it in one instance to expel a tapeworm, with success.

A CASE OF AINHUM IN ITS EARLIER STAGES.

By F. C. Wellman, M.D.

Benguela, West Africa.

One of the cases of ainhum which I mentioned recently in these columns came to me yesterday and I made a drawing of his foot. He is a young man about twenty years old, and in the best of health. The reason I have been interested in this case is that the process is of recent development, only dating from last wet season. It will be seen from the figure that the

toe has not entirely lost its original contour, and the nail is still intact. He states that the trouble (which is here called "Esola" or "Ombanja") began on the inner and plantar surfaces of the toe, and ascribes it to a fever he had about a year ago. The lesion as yet does not interfere with his walking, running, or carrying, as he is a good messenger and porter. He states that the toe sometimes aches at night.

NOTES FROM ANGOLA.

By F. C. Wellman, M.D.

Corresp. Memb. Am. Soc. Trop. Med.

(*Continued from p.* 328.)

Note XIII.—On the Absence of Certain Diseases from Southern Angola.

It is always a dangerous thing to venture statements as to the absence of any disease from a certain region, as the writer has proved, having had to report the occurrence of one or two affections which he had previously mentioned as probably not existing in his district. Still, the statement may be of value that in the course of somewhat extensive patho-geographical investigations, undertaken in 1896, 1899 and 1903, the following important diseases were not seen or heard of among the natives of this province, viz., typhoid fever, typhus fever, scarlet fever, measles, rubella, diphtheria, erysipelas, rheumatic fever, cholera, yellow fever, plague, Malta fever, pellagra, scurvy, anthrax, glanders, arthritis deformans, and gout.

Note XIV.—"Walking Cases" of Dysentery.

What seems to be amœbic dysentery may, in this part of Africa, be mild, chronic, or recurrent. I have seen cases of whites suffering from "chronic diarrhœa" who, with some effort, were able to be about their work, but in whose fæces might be seen numbers of amœba, morphologically identical with *A. coli*, and even small sloughs. Some months since I saw a fatal case of blackwater fever, supervening on the recrudescence of an old dysentery of this character. Amœbæ, which cannot be told from *A. coli*, are occasionally encountered in the stools of healthy persons here, and accepting (as the writer does) the view that amœbæ are the cause of this type of dysentery, one can understand that these lie ready to invade the intestinal mucosa whenever a favourable occasion presents itself.

Note XV.—An Insect which Preys upon Ticks.

Not long ago I sent to the British Museum an insect which I discovered in the course of some observations on *Ornithodoros moubata*, Murray, and its relation to human spirillosis. The insect is called by the natives "Ochindundu" (the striker), and feeds on the ticks mentioned, catching them and sucking, by means of its powerful piercing proboscis, the blood with which they have filled themselves—much in the same manner as bugs (*A. lectularia*) are hunted by a similar animal, which I remember having heard mentioned in my student days, but the name of which I have unfortunately forgotten, along with more important facts then learned. I have watched the "Ochindundu," and exhibited it to others, in the very act of feeding on the ticks. Its first two pairs of legs are provided with curious paddle-like structures, with which it securely holds the tick while mulcting it of its ill-gotten blood, the insect sitting, as it were, on its long hind pair of legs during this process. When the report on this queer assistant to the tropical sanitarian is received from the British Museum I shall ask the Editors to print it in these columns.

Note XVI.—Concerning the Prognosis of Blackwater Fever.

One occasionally hears from the laity (and even from medical men) such unscientific and meaningless statements in this connection as: "Dr. Blank has never yet lost a case of blackwater fever"; "All my cases recovered"; "Only two cases died out of twenty admitted to the hospital," &c., &c. According to the writer's experience with the disease in this colony there are two classes of patients. The first can endure almost any number of attacks (one hears of men who have suffered fifteen or twenty, or even more), but is unfortunately so small as to almost remain out of the account when making a prognosis. The other class, which includes the vast majority of cases, can usually stand one, or even two attacks, but often go during the third or fourth. Roughly speaking, *the danger increases in geometrical ratio with the number of attacks*. So (at least in this country) in making a prognosis in a given case, or in arranging statistics, it is of the first importance to take account of the number of previous attacks. In fact, I regard mortality statistics in this disease of little or no value without this qualification. The occasional very slight attacks, lasting only a few hours, which are sometimes sandwiched in between the grave attacks, are not a constant enough feature to seriously affect the above calculations. The writer's rule is to invalid home after each of the first two attacks, and to refuse to pass a man to go out after the second.

Note XVII.—A Point in the Life-history of Sarcopsylla Penetrans.

It is well known that the female chigger (*S. penetrans*), when pregnant, burrows into the tissues of her host, and swells up during gestation to a comparatively enormous size. While accurate accounts of the succeeding steps in the metamorphosis have been published, yet in medical literature the descriptions are often vague or erroneous. For instance, we read such statements as these: "The eggs are not deposited while the parasite is in the skin"; "The ova do not leave the body until the parent reaches the soil"; "The female bores into the skin and there deposits her eggs"; "The escaping larvæ give rise to ulcers," &c., &c. During the examination of large numbers of Bantu men, I have made the following observations on this stage in the life-history:—

(1) The eggs are always laid while the chigger is yet imbedded in the flesh of her host.[1]

(2) They never (at least in this climate) hatch into larvæ in the body of the parent.

(3) They are not laid at one time in masses but discreetly, and sometimes at considerable intervals, depending on circumstances. If the chiggers are in the sole of the foot, and the infected person walks about, the eggs may be seen dropping from his feet as he goes, or by pressing gently on the skin near a ripe chigger two or three eggs may be seen to escape one after another. Such eggs readily hatch out. So while it is doubtless a good rule to burn all chiggers removed, yet this has no effect on the usual mode of propagation, and so long as natives go about with infected feet the cycle will go on.

(4) The shell of the parent when dead, and empty of eggs, usually dries up *in situ* and causes no further trouble. Occasionally it may cause irritation, swellings and ulcers, but most of the abscesses, sores, &c., from chiggers come from removing the insects with septic instruments.

(5) The mature ova, if placed in a glass-covered dish containing some dust from the floor, go through the developmental stages common to all fleas, which have often been described. In natural conditions they develop in the dirt and cracks in the floor, and in chigger countries it is therefore important to compel one's native servants to keep their feet clear of chiggers, and to allow no other natives (especially children, who are always infested) in one's quarters.

Note XVIII.—A Clinical Classification of the Tropical Ulcers Seen in West Africa.

Most of the "ulcers" met with in this general region can be fairly grouped under the following heads:—

(1) Tropical phagedæna: (*a*) rapid, (*b*) subacute.
(2) Indolent ulcers.
(3) Malarial sores.

(1) *Phagedæna.*—I recognise two distinct forms of the disease—a severe and a mild—which I have called rapid and subacute phagedæna. Rapid phagedæna is a terrible affection, pursuing a relentless course through skin, soft tissues, and even bone, with frightful rapidity. Joints are disorganised in a few days or even hours, and a limb may become a putrid mass in an almost incredibly short period. It is fortunately rare. I have seen it once beginning on the cheek. Treatment is of no avail and death always results. The attempt of Le Dantec to identify tropical phagedæna with the hospital gangrene of temperate climates can hardly stand in view of the remarkable readiness and thoroughness with which operation wounds heal in the Tropics, and especially among blacks. I have never seen phagedæna or anything resembling it set up in operation wounds, even those made by native doctors with septic instruments. The subacute variety is that usually described in text-books, and is sharply differentiated from the above by its tendency to spontaneously arrest its course and set up granulations. Even in its initial spreading stage it is milder and slower than the preceding (although quite severe enough), and recovery is the rule. It may eventually assume a more or less indolent character.

(2) *Indolent Ulcers.*—The frankly indolent ulcers are often of this type almost from the beginning of their course. They may be active for a few days only at the commencement, and all angry symptoms subside while the sore is no larger than a shilling piece. It is this form which oftenest gives the history of dating from a small spontaneous vesicle (*vide* my note in the

[1] Her different behaviour after artificial removal does not form a real exception to these statements. In such an event she extrudes all her contained eggs at once and dies, but such eggs do not hatch into larvæ. Even if the chigger has completed her gestation and has begun to lay her eggs before her removal, only the most mature eggs in the posterior part of the abdomen will develop.

Journal for April 5th, 1905, p. 118), which I find was mentioned in connection with tropical ulcers by Bechtinger as far back as 1869. They may run on for years. I have seen them completely encircle a limb, although, as a rule, a "bridge" of sound skin is left free even in severe cases. A good many ultimately recover, especially if kept clean.

(3) *Malarial Sores.*—The last type usually appears as a small, definite, generally round, punched-out ulcer which I have called "malarial," because it generally heals quickly under the internal administration and local application of quinine. This peculiarity of the sore was first brought to my notice by Dr. Walter Fisher, of Northern Rhodesia. The name is not exactly fortunate, as the sores are quite possibly not all malarial in origin. This type would probably include the lesions described by F. Plehn, on the Tanga coast and other places. The type is not so constant as the others mentioned, as recent descriptions from different parts of Africa show. The ulcers are generally multiple, and of comparatively trifling importance. A local epidemic of sores in South Angola has been recently reported to me which, judging from a verbal description, also falls under this class. I need hardly say that the different types mentioned in this note may run the one into the other in various cases, and that the classification (which is entirely clinical) is not put forth in a dogmatic spirit, but only as a suggestion to those working on the subject.

(To be continued.)

ON A SPIROCHÆTE FOUND IN YAWS PAPULES.

By F. C. Wellman, M.D.
Benguella, West Africa.

Several weeks ago I sent a communication to the American Society of Tropical Medicine, in the course of which I wrote as follows: "Some time ago while examining a scraping from a yaws papule I was somewhat surprised to see under the $\frac{1}{12}$ several active spirilla-like bodies which, in form and movement, closely resembled *S. obermeieri*. Thinking it to be a case of the parasite of relapsing fever, I thereupon made a prolonged and careful examination of the blood, which, however, contained no spirochætæ. I found the parasites in other papules of the same case.

Only yesterday there reached me the report of the meeting of the British Medical Association at Leicester, which mentions a paper by Castellani,[1] announcing the demonstration of spirochætæ in two cases of yaws in Ceylon. In view of this statement of Castellani's I am emboldened to add the following details from my medical diary to the observation quoted above. I had felt (in view of my failure to find the spirochæte in several subsequent instances) a natural diffidence in submitting the slender evidence of one case; but on reading the paper mentioned I have thought it worth while to call attention to what may be now regarded as a confirmation of Castellani's observation.

From an entry in my diary, dated July 14th, 1905, I extract the following notes: The case was seen during an expedition into Chiyaka district, South Angola. The patient was a girl about twelve years old, who showed a plentiful and characteristic yaws eruption on her face, chest, back, forearms and nates. Having several years ago made an attempt at solving the bacteriological problems connected with yaws, I had at first no thought of examining the secretion from the sores, but unpacked my microscope with the intention of having a look at the girl's blood, as I was in a new district, and such opportunities were rare, owing to the suspicions of the natives. Having gone over two fresh films with no result except a pigmented leucocyte, I was about to replace the instrument when, as my porters were resting, it occurred to me to examine a scraping from one of the papules. On doing so, I at once noticed under the $\frac{1}{12}$ several motile spirilloid bodies which puzzled me, as the natural inference was that I had to do with a case of "tick fever," the parasites of which I had overlooked in my two previous blood examinations. I therefore re-examined the blood with great care, but found no spirochætæ. Making scrapings from two other papules, however, I readily found spirochætæ in both preparations.

I have since carefully examined three more cases of yaws from the same district, with negative results.

I publish this note to obviate any misunderstanding that might arise from the tenor of the paper calling attention to my independent discovery of this organism in yaws papules, which was on its way to America before Castellani's announcement reached me. It is significant that this observation (which has been spoken of as "one of the most important discoveries of recent times, considering the fact that the *Spirochæte palida* has been found, by Schaudinn, in syphilis, and considering the relation said to exist between yaws and syphilis"[2]) should have been almost simultaneously made in two such widely separated countries as Ceylon and West Africa. It is to be hoped that observers in all parts of the tropical world will avail themselves of every opportunity to thoroughly investigate the matter.

I am also publishing a statement similar to the above in America.

SYMMETRICAL PENDENT KELOIDS OF THE EAR.

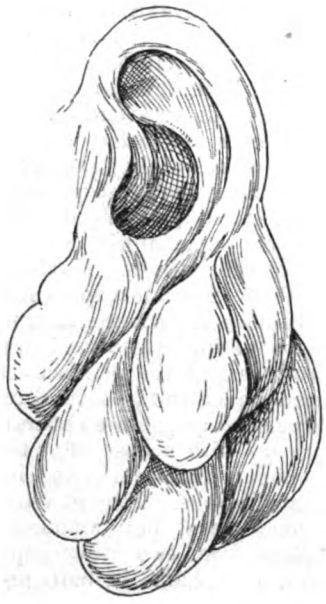
By F. C. Wellman, M.D.
Benguella, West Africa.

I send you a drawing of the ear of a Bantu girl, from which hung a six-lobed keloid, somewhat different in shape and arrangement from any that I had previously seen. As a rule the lobes composing such growths (which are extremely common among the Angola Bantus) are asymmetrical, and often the broadest axis of each lobe is at right angles to its

[1] "On the Presence of *Spirochætæ* in Two Cases of Ulcerated Parangi (Yaws)." Abstract in the *Journal of Tropical Medicine*, August 15th, 1905, p. 253.

[2] *Brit. Med. Journ.*, August 5th, 1905, p. 282.

pedicle. When sessile, and on the trunk, the growths not seldom show a tendency to spread horizontally. In the present case, however, the growth is remarkably regular in outline, the lobes are all ovoid and



nearly uniform in size, their long axes correspond both with each other, and with that of the whole tumour, and the resulting *ensemble* is strikingly suggestive of a small bunch of Madeira grapes.

SMALL-POX INOCULATION IN INDIA.

By Major G. H. Fink, I.M.S., M.R.C.S., L.S.A.(Lond.).

(*Continued from p.* 335.)

I was about to move away when he caught me by the arm, and said: "Here are my children; take and vaccinate them."

I vaccinated his two children then and there, when there was a great rush from all parts of the villages round about to be done, and as fast as I and my superintendent could operate we did so, and thus broke down a barrier which had been set up for years. Are our anti-vaccinationists not very much in the same position to-day?

It is my opinion, therefore, that in the East, among an intelligent people who are willing to reason with you, you must let them have their own way as a matter of experiment, but show them what your duty is, and what the orders of Government are which you are there to carry out, whether right or wrong; and if prevented, the Government should know the reason why their orders are disobeyed. This is clearly our position of the matter, as we cannot possibly do more. We have done all in our power, and the rest is in the hands of the authorities who move the machinery.

In a country such as Sibsagar, where the Assamese are a cleanly people generally, there is very little chance of small-pox epidemics breaking out unless either imported or produced through inoculation. The imported epidemics are through immigrants from congested areas in India coming to enlist in the tea-gardens as coolies, and in a state of poverty and filth in a large number of cases; hence the danger of small-pox in a district depends upon this as one cause and a very common cause, and it is, therefore, very necessary for tea-garden doctors to co-operate with the civil surgeon to so organise the vaccination as to make it impossible for coolies to bring it into a district in Assam. I would, therefore, strongly urge, from the experience I have had, that all coolies be vaccinated before being allowed to enter into Assam, and not after their arrival at the coolie depôts or tea-gardens. This is only fair to the people of Assam, and fair to the medical staff who are short-handed, and fair to all of us who are consumers of tea.

Creative small-pox epidemics, that is, epidemics which occur through inoculation methods, though perhaps not so grave a danger, yet are a danger; hence it is quite right that stringent regulations and laws should be framed to put a stop to this practice for the good of the whole community. It wants knowledge of the people and tact to break down such barriers; but it must never be forgotten that an old custom suddenly broken down, even by reasonable arguments, leaves a sting behind in the case of certain gentlemen of a peculiar temperament, who are the *paterfamilias*, as it were, of the whole community; hence, it is the duty of Government when they frame a rule or law on the subject, to support civil surgeons and to see that the rule is given effect to, and not, as unfortunately does sometimes happen, let those who are charged with this right duty suffer for carrying out an order effectively, which in the case of the Indian medical officer is the receiving of a commission, and he gives his word to obey the orders of the Government, whether that commission designate him as "Surgeon," "Doctor," "Surgeon-Captain," or "Captain."

Misrepresentations there will be, together with plausible arguments on the other side; but these need enquiry into and sifted if we are to be allowed to do our duty as medical officers trained in the schools of England.

I maintain if the Government find that they cannot support their Civil surgeons and Health officers through a difficulty in which these officers have risked even their lives rather than flinch from duty by obedience to an order of superior authority, it is time that a Minister of Health were created for India and the Colonies respectively, who would be responsible for all measures of health to the Prime Minister and the Cabinet, so that laws and regulations will be given effect to properly in matters of disease, and by allowing selected medical officers a seat on the Council of the Viceroy and his Governors and lieutenant-governors who desire to carry out the wishes of the Government, all measures relating to health and disease would receive the best attention possible, and be reported carefully from their scientific aspects through such local councils to the responsible head of the Govern-

ment, and thence through him to the Minister of Health for the information of the Cabinet, and evil practices, which endanger the world, checked. We should by such measures be able more correctly to gauge where the responsibility lies for the carrying out or the cancelment of certain orders when they should be strongly supported, whereas, it is impossible to do so if the wheels of the machinery are allowed to revolve often in opposite directions, as sometimes does occur; while in the multitude of voices, frequently, there is no proper counsel on grave questions of health and disease either given or accepted, and then, when grave epidemics come, the doctors and surgeons have the burden and heat of the day to bear to check it, and very little to encourage them in their work of research.

In dealing with the question of the army of micro-organisms, it is just as important that an organisation should be as complete as in the case of an army of soldiers. Is our medical organisation in every respect what it should be in India? I say most emphatically it is not, although it is a trifle better than it was a few years back.

The reproach often thrown out against the medical department is, that it does not yield a revenue as some of the other departments, hence there is not that interest taken by the Executive in its work. Certainly we are not money-making machines, nor do we seem to be money-taking ones. To obtain that revenue it is necessary to have healthy labour forces, and to obtain a greater revenue for any country at the present time of competition, the labour forces of our Empire must be healthier year by year, and the torch of education in Science must be kept burning for the good of Science. All scientific work of value to commerce should be turned towards Scientific Schools of Education, and Research work encouraged, and such a torch should ever burn in our Empire as was never seen before.

Have we endeavoured to make the medical a revenue-producing machine? If every man were taxed heavily for bringing in dirt and disease we should soon increase our revenue.

To have an army as an efficient fighting machine we require healthy, strong men, well disciplined and drilled in the art of fighting, and for this the people have to pay a large price, and it seems necessary. To have an army for revenue-producing purposes in a healthy way and free from taint we need an army of healthy labour forces at work, working healthily for the good of all. Whose duty is it to see to this? Why, the medical department of the Army, Navy, and the Civil branch of our empire, who must work to save us from reproach, and point out the real evil of inoculation. We can but represent our case, and show the disastrous consequences of the economic machine which shears the medical department year by year, and it rests with the Government to either court disaster, or to help us through our troubles by meeting us at any rate half-way, since we do not flinch from out duty because of the dangers ahead, nor do we discourage people in their worship of any gods if they will only let the medical department do their work according to the light of science, and the testimonies of time and experience which have shown us clearly the history of inoculation among an ancient people, wise in their methods for the times gone by; but which in these days of progress and enlightenment should accept what has been proved by good old Jenner and his followers, who mean to stick to him as the cowherds stuck to their duty bravely at Bristol amid the small-pox which laid low their fellow-men, and who though inoculated in their fingers with the cow-pox from the teats of milch cows, were saved from the terrible ravages of small-pox. No greater experiment for the good of mankind was accidentally produced as at Bristol in the days of Jenner whom we revere now, as much as the cow which is sacred to the Hindoos.

"Journal of Cutaneous Diseases, including Syphilis," October, 1904.

PINTA: PANO BLANCO. P. G. WOOLEY.

Trichophytic diseases are common in Manila. The case is reported of a boy who exhibited slowly spreading pinkish-white patches, irregular in size and shape, on the ankles, dorsa of feet, shins, knees, elbows, hands, wrist, and one on the right shoulder. The patches were roughened, slightly infiltrated and scaling; there was some itching. Scrapings showed mycelial filaments, usually long, ending in a bunch of spores (? penicillium). The condition is identical with pinta, and with the cases of Segram in North Africa, and of Sandwith in Egypt. The presence of sensation and itching exclude leprosy, the colour and odour of the patches insure a correct diagnosis. T. P. B.

"La Tribune Medical," November 4, 1905.

MALTA FEVER IN ALGERIA.

J. Lemaire finds that there is often confusion between this and other prolonged febrile conditions, when there is enlargement of liver and spleen, with anæmia. He considers it of frequent occurrence, having seen thirty cases in five months. In nine cases where 2 to 4 cc. of infected blood were mixed with 250 cc. of pure blood, a pure growth of *Micrococcus melitensis* was obtained. In addition to the tests of Widal and Wright, he injects the expectorations into guinea-pigs, which do not suffer in general health, yet their blood agglutinates the bacillus of Malta fever. T. P. B.

"La Grèce Médicale," January, February, March, 1905.

MALARIA AND HEART DISEASE.

Tsiantaphyllides discusses the connection between the two diseases, and shows that malaria is often the cause of heart disease. Sometimes the cardiac lesion is trivial, at others it is serious, and refuses to yield till active treatment is directed to the malaria. A matter of great importance in practice is that the valvular lesions may be permanent. The chief effects of malaria on the heart fall on the muscular tissue and the valves of the left side, but all parts may be effected. T. P. B.

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THE

Journal of Tropical Medicine

DECEMBER 1, 1905.

APPEARING AND DISAPPEARING MEDICAL SCHOOLS.

IN England at the present moment there is a dislocation of medical teaching which is having a serious effect upon many London schools of medicine. In England in the north, the west, and the midlands, universities have within the last few years sprung into existence, and it would seem likely that every large city will soon have its own University. In Scotland there were five universities up to the year 1860, but after the fusion of the two universities in Aberdeen four have been found sufficient to satisfy the insatiable appetite of the Scotch for education. England is now following the example of Scotland and establishing well-equipped universities in the larger centres of population. The people have rebelled against the "universitism" of Oxford and Cambridge; they desire education and instruction in the special sphere they have chosen for their work in life. The University of London first raised the standard of revolt some sixty years ago, but the University of London was, and is, a mere examining board ; and so far as medicine is concerned, an exalted combination of the examining boards of the various corporations of so-called colleges of physicians and surgeons in London, Edinburgh, Glasgow and Dublin. The spirit of municipality has, however, grown rapidly of late, and the glamour of the old-established seats of learning, and of the value of diplomas granted by examining boards has fortunately, or unfortunately it may be, fallen away.

The creation of universities in Sheffield, Leeds, Manchester, Liverpool and Birmingham is responsible for the reduction of the numbers of medical students in the London schools. Some of the schools have sent their pupils elsewhere, and several more are threatening to close their doors.

Increase of expenditure is proving the real cause of these schools' difficulties. When the examining boards demanded that the teachers of anatomy and physiology should be pure anatomists and physiologists the days of the smaller schools were doomed.

The London schools could not afford to pay salaries for eleven or twelve anatomists and physiologists without State aid ; and as that was not forthcoming amalgamation was imperative, involving the disappearance of several of the less endowed schools.

POST-GRADUATE TEACHING.

Post-graduate instruction has become the subject of the hour. Medical men in practice demand it, as proved by the large daily attendance at the Post-Graduate College—the Polyclinic—and at the West London Hospital. Other schools are organising post-graduate teaching, and every London school that has fallen behind in the race is discussing the matter.

St. George's Hospital having dropped student teaching is now asking for a large sum to establish a post-graduate school, but the latest and

perhaps the most important addition to the number of post-graduate schools is that of the

LONDON SCHOOL OF CLINICAL MEDICINE,

in connection with the Seamen's Hospital, Greenwich, London, S.E.

Every one is aware of the public-spirited manner in which the Seamen's Hospital Society came forward in 1899 in the matter of the London School of Tropical Medicine, and provided the means of instruction in tropical diseases at their branch hospital at the Albert Docks; and now the authorities of the Society are about to initiate a post-graduate school at their large hospital at Greenwich. This public-spirited endeavour deserves every encouragement and support. The staff of the hospital in the most unselfish manner have not hesitated, for the benefit of the contemplated clinical school, to forego some of their privileges and to invite eminent physicians and surgeons from other schools to take part in the teaching and clinical work of the school. In the department of medicine we find such well-known names as those of Sir Dyce Duckworth, Professor Hewlett, Dr. Frederick Taylor, Dr. Guthrie Rankin, and Dr. Rose Bradford. On the surgical side the names are of no less consequence: Sir William H. Bennett, Mr. Mayo Robson, Mr. Carless, Mr. William Turner, and Mr. Lawrie McGavin. Mr. Malcolm Morris has charge of the teaching of "Diseases of the Skin," Mr. Cargill "Diseases of the Eye," Dr. St. Clair Thomson "Diseases of the Throat, Nose, and Ear." Practical and tutorial classes are also being organised for all branches of medical instruction. Residential accommodation for post-graduates has not been neglected; and the advantages of a mess and club-room are provided at the hospital itself. The whole scheme has been well thought out and carefully organised; and the liberal lines on which the school has been established brings it home to us that a great public service has been instituted deserving the support of every one who wishes well to the profession of medicine.

EXTRACT FROM THE "EDITORIAL" IN *CLIMATE*, OCTOBER, 1905.

IT is with very sincere regret that we address for the last time the readers of *Climate*, but at the same time we have the great satisfaction of announcing that some provision will be made in the future whereby they may be able to obtain the latest information concerning the progress of tropical hygiene. As will be seen by the correspondence which will be found in another column, the Editors of the *Journal of Tropical Medicine* have generously agreed to devote four issues annually of their valuable paper to the consideration of scientific questions and hygienic subjects, which would be of interest not only to the medical profession, but to the large class of residents in tropical climates, to whom some knowledge of health problems is essential. In the interview with Sir Patrick Manson, which appears on another page, will be found the expression of very strong views as to the necessity of the education in these subjects of all Europeans who are called to labour in tropical climates, and these special issues of the *Journal of Tropical Medicine* will undoubtedly prove to be an important connecting link between the medical experts who are investigating the cause of disease and those who must act upon the advice which they are able to give. As we have often contended, it is of little use for medical men to advocate reform unless they are backed up by the public opinion of the intelligent residents in tropical climates, from whom in some cases the money for the promotion of reforms must be forthcoming, or whose active co-operation, as in the case of governors of Colonies and other high officials, is essential if progress is to be made. Again, missionaries, and those who will have the responsibility in the instruction of native children in the problems affecting the transmission of disease by insects, need it, as Sir Patrick Manson has so well pointed out. But it is almost invidious to single out any classes who should be especially instructed, for the co-operation of all is needed, and the obstinacy of the few who may refuse to adopt hygienic measures may, as is so often the case in other diseases, prove a serious danger to the many.

There will be found enclosed in this issue a special order form for subscription to these special hygienic numbers of the *Journal of Tropical Medicine*, which the publishers have issued, and which contains information as to the method of subscription. We cordially invite our readers to take advantage of this offer.

The cordial support which *Climate* has received from the two British Schools of Tropical Medicine in London and Liverpool has been a matter of great satisfaction, and our hearty thanks are due to Sir Patrick Manson and Major Ronald Ross for much valuable advice and assistance.

Our readers have not been a very large body, but we believe that they are a very influential body, and we greatly value the kind expressions of regret which have reached us from many sides on the announcement of the discontinuance of *Climate*.

To Mr. James Cantlie and Professor Simpson, Editors of the *Journal of Tropical Medicine*, we offer our sincere thanks for their interest in our paper, and we wish them every possible success in continuing the work which *Climate* has begun.

TREATMENT OF BLACKWATER FEVER BY "POTASH."

TO THE EDITORS OF THE "JOURNAL OF TROPICAL MEDICINE."

SIRS,—I was interested in reading a few months back in your Journal a note by Dr. Cameron Blair, W.A.M.S., on the use of potassium salts in the treatment of anæmias generally, and of blackwater fever particularly. I have myself no practical knowledge of the *rôle* of potassium salts in these conditions, but I have observed that "potash" is largely used by the natives of the Lake Chad district when they suffer from "blackwater fever." Their treatment for symptoms which apparently coincide with those of hæmoglobinuric fever in Europeans consists in drinking large quantities of potash water and sucking fresh limes. This seems a rational line of symptomatic treatment, at any rate, but it must be borne in mind that both remedies lie within easy reach of all, and are by no means confined to the treatment of "blackwater fever." I only wish to state facts, any definite conclusions would be premature without further careful investigation.

I am, yours &c.,

ALLAN C. PARSONS,

West Africa Medical Staff, N. Nigeria.

HEREDITY OF ALBINISM.

WE have received the following notice for publication:—

"An important investigation as to the *Heredity of Albinism in Man* is being carried out by Professor Karl Pearson, F.R.S., of University College, London, with the co-operation of Mr. Nettleship (Shottermill, Surrey, England) and Dr. E. Stainer (Physician to the Skin Department, St. Thomas's Hospital), 60, Wimpole Street, London, W. Cases bearing on the subject, *either positively or negatively*, will be very thankfully received by any of those gentlemen. The investigators desire to collect a large series of examples of albinism—complete or incomplete, general or partial—in which the family history of the albino patient can be traced for one, two, three or more generations. The sex and prevalent colour of eyes and hair, in as many of the patient's relations and ancestors as possible, should also be noted, whether any of them were albinotic or not, also all instances of consanguineous marriage. Cases of albinism of the eyes, in persons with congenitally pied skin (most easily recognised amongst dark races) will also be very valuable, even without family history, acquired leucoderma being, of course, excluded."

Towards the elucidation of this interesting subject medical men in the Tropics have ample opportunity of contributing, and it is to be hoped that many will send at least a notification of cases met with in their practice amongst the coloured races.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Monats. f. prakt. Derm.," 1905, p. 88.

INJECTIONS OF CHAULMOOGRA OIL IN LEPROSY.

Tourtoulin began this treatment in 1894, in doses of 5 grammes (1 dram 15 minims). In 1901 he reported that nine cases of leprosy which he had treated with the oil, some subcutaneously, some internally, had, with one exception, all benefited. Eleven cases treated by other observers have all improved: the infiltration diminished, sensation returned, nails grew again. Improvement began to show itself in most cases after the fifth injection. The injections may be painful, and out of 900 injections, four times pulmonary embolism was seen, with difficult breathing, pallor, symptoms not sufficient to prejudice the treatment. The subcutaneous tissue of the forearm or leg is the best place for the injections, which must be continued for years, as the lesions are apt to reappear, though in a milder form, if injections are omitted.

T. P. B.

"Medical News," July 29, 1905.

THE CURE OF LEPROSY.

Dyer has obtained good results only from strychnine, anti-venomous serum, chaulmoogra oil, and chlorate of potash. Ten cases remained free from signs and symptoms from one to seven years, the conclusion being that leprosy is curable, certainly in all the early stages. The essentials of treatment are: (1) Full diet, avoiding only indigestible foods. (2) Hot baths twice a day, with or without soda. (3) The patient needs tonics, febrifuges. Intercurrent or complicating diseases should be watched for. (4) Strychnine is a *sine quâ non* in the treatment. (5) Chaulmoogra oil is best given before meals, in capsules, in hot milk or in milk of magnesia. The initial dose should be three drops, and increased every second or third day. At times it is advisable to give the oil in pill form combined with extract of nux vomica, with tragacanth and soap as excipients. (6) Improvements may be delayed for three or six months or longer. (7) Treatment should be continued when all evidences of the disease have disappeared.

T. P. B.

"Nederlandsch Tydschrift voor Geneeskunde," September 30.

MYIASIS IN THE ARGENTINE. ROORDA SMIT.

In Cordoba infections of wounds are due to *Calliphora anthropophaga*, while in Buenos Ayres *Lucilia hominivorax* is most frequent.

Instrumental interference with wounds is usually disastrous. The most satisfactory treatment is the application of calomel; in the cases of open wounds the powder is dusted on, and a suitable dressing superimposed. In dealing with sinuses of the nose and ear the powder is blown in, and a plug of wool, covered with the drug, inserted.

T. P. B.

"Le Caducée," October 7, 1905.

MOSQUITOES AND HÆMOGLOBINURIA.

M. C. Claude describes four cases seen in Oran, in Algeria.

(1) A married woman, long resident in the district, was attacked with severe gastro-bilious fever, the symptoms being jaundice, vomiting, coma, and three crises of hæmoglobinuria. She had 6 grammes (a drachm and a half) of quinine in hypodermic injections before the first crisis. At this time her husband and sister had severe malaria, without having taken any quinine as a preventive measure.

(2) A married woman, a recent resident, had an access of intermittent fever, which developed into a quartan ague. The symptoms were generalised purpura, pain in the back, two attacks of hæmoglobinuria; and death on the sixth day. No quinine had been taken before the attack. Three to four grammes were administered by the mouth or subcutaneously during the illness. Her husband and sister had characteristic intermittent malaria.

(3) An ex-soldier, an old resident and cachectic, on returning from France was suddenly attacked with fever, having gastro-bilious symptoms, epistaxis, bilious diarrhœa, hæmoglobinuria on the fifth day; death took place on the next day. No quinine had been previously taken; 5 grammes were injected during the illness. At the same time a child of five, in the same house, had a typical attack.

(4) A European girl, aged 19, an old resident, was three days ill with continued fever, epistaxis; a generalised purpuric rash appeared on the sixth day, with hæmoglobinuria; she died on the eighth day. A gramme and a half of quinine was injected. At the same time the rest of the family, four in number, had malaria.

The cases occurred during a severe epidemic of malaria, and the blood was not examined. The conclusion arrived at is that hæmoglobinuria is a paramalarial manifestation, because they appear with similar frequency, at the same times in identical localities.

"Le Caducée," October 21, 1905.

TUBERCULOSIS IN THE FRENCH COLONIES.

Pulmonary Tuberculosis.—Kermorgant states that since New Caledonia was made a penal settlement, the time-expired men have spread tuberculosis amongst the natives, who are decimated by it and leprosy. It is the same in Polynesia, especially at Tahiti.

In Indo-China phthisis is not very prevalent.

In Senegal it is rapidly extending. On the Ivory Coast phthisis and dysentery cause the majority of the deaths. In Dahomey it becomes less common towards the interior, in proportion as there is less contact with Europeans. On the Congo, where it was previously unknown, it is extending rapidly. In Madagascar there is less tuberculosis than in France. It is very common amongst the coolies from Reunion, who stay under observation six months before they are sent to Diego Saurez. At Mayotte it causes a third of the deaths.

In the West Indian Islands the majority of the deaths are due to it, especially amongst the blacks. In Cayenne it carries off a third of the coloured population. In the Colonies tuberculosis is not only extremely common, but also extremely fatal.

Europeans are not more liable to tuberculosis in the Tropics than in Europe, but the disease is much more rapidly fatal. Amongst the semetic races the Arabs are especially vulnerable. Negroes are especially liable to tuberculosis, which is rapidly fatal. The yellow races have only a relative immunity. Half-castes are less resistant than the pure-bred natives. The transport of individuals to a new environment, differing in temperature, in humidity, in prevalent winds and rainy seasons, has a marked influence, and predisposes to bacillary infection, which has an exaggerated virulence.

Occupation, as the fatigues at military service by the natives, soon develops latent weakness. Tuberculosis of the lungs is the scourge of convents. Penal settlements suffer severely; of the convicts in Cayenne, 52·42 deaths per 1,000 are due to tuberculosis, and 110 in New Caledonia. Amongst the ticket-of-leave men it is 43·4 in Cayenne and 104 in New Caledonia. The military garrison have 145·4 out of 1,000 deaths due to tuberculosis in Cayenne, and 228 in New Caledonia.

Climate it only a secondary factor in the production of tuberculosis; the primary cause is neglect of hygiene, and it is in connection with this that prophylactic measures should be taken. In Tahiti alcohol is prohibited, and it should be excluded from West Africa; at all events it should be heavily taxed, and the supply of it as part of the wages of natives should not be allowed.

Tuberculosis and Malaria.—Crespin explains the extension of tubercle in Algeria as due to the relations between the natives and Europeans favouring contagion.

Tuberculosis may develop in persons who have previously suffered from malaria, or the two diseases may appear together. When tuberculosis develops in a patient with chronic malaria, sometimes its progress is very rapid; at other times its progress is arrested, or even entirely stopped.

There is no antagonism between the two diseases.

Surgical Tuberculosis amongst the Arabs. — In Tunis tuberculosis is very common amongst the Arabs, especially in the form of lesions of the bones and joints. It would seem that there is special liability to disease of bone, as shown by the frequency of osteomyelitis, due to hereditary syphilis. Not unfrequently suboccipital caries is seen, starting from the base of the skull, and affecting the neighbouring parts. T. P. B.

NEW CURE FOR DYSENTERY. — Messrs. Allen and Hanbury, Plough Court, London, E.C., have prepared a tincture from the root of a South African plant which has obtained considerable local reputation in the treatment of acute and chronic dysentery in South Africa. Any medical man wishing to test the efficacy of the drug can obtain the preparation from Messrs. Allen and Hanbury.

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THE

ANIMAL PARASITES OF MAN

A Handbook for Students and Medical Men

BY

DR. MAX BRAUN

Professor of Zoology and Comparative Anatomy, and Director of the Zoological Museum of the University of Königsberg, Prussia.

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BROUGHT UP TO DATE BY

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Reviews.

THE ANIMAL PARASITES OF MAN.

English-speaking medical men are again indebted to Miss Pauline Falcke for an accurate and excellent translation of a standard German work. To few of us is given the facility to read a foreign language with the expedition necessary in these bustling times, and to even the favoured few who are apt linguists, many lack that intimate knowledge of any foreign language requisite for scientific accuracy. We are therefore beholden to scholars of Miss Pauline Falcke's special attainments for the care and labour bestowed upon translations intended for our instruction and benefit. Messrs. Bale, Sons and Danielsson have time and again risked large sums of money in providing useful translations of medical works, more especially for the benefit of medical men resident in the Tropics, and to them we are deeply indebted, and hope that their efforts are duly appreciated. Encouragement of this useful branch of publication can be shown in one direction only, namely, by purchasing the works intended especially for those engaged in tropical work; and as only the best works in foreign languages are translated, purchasers can have no hesitation in providing themselves with any book Messrs. Bale, Sons and Danielsson place in the market.

The "Animal Parasites of Man," by Max Braun, has no rival; it is the most complete, erudite and accurate book on the subject extant. The investigation of tropical diseases proceeds so rapidly, and new discoveries are so frequent, that even before a book in a foreign language can be translated, however rapidly, the book dealing with them is apt to be behind the times. In the present instance the drawback has been obviated by two masters of the subject in this country, namely, Louis W. Sambon, M.D., and Fred V. Theobald, M.A., who have brought our knowledge of animal parasites in this book up to date.

The introductory chapter on Parasites in General is a liberal education in itself. Plant parasites—phyto-parasites—are not described in this volume; animal parasites—zoo-parasites, are alone dealt with. The parasites are grouped into occasional, permanent and incidental sections. The former terms explain themselves; by incidental parasites are meant those parasites of man that are only rarely met with. The origin and derivation of parasites is interesting reading. The animal parasites of man are classified as:—

A. Protozoa, including the Rhizopoda, Flagellata, Sporozoa, and Infusoria.
B. Platyhelminthes (Fluke-worms), including Trematoda and Cestodes.
C. Nematodes (Thread-worms).
D. Acanthocephala.
E. Hirudinea.
F. Arthropoda—the Arachnoidea, the Myriapoda, and Insecta.

The Culicidæ, or Mosquitoes, are specially and separately dealt with, and other Nematocera, such as Sand-flies, Flies, Gad-flies, Wolf-flies and Tsetse-flies, are fully described.

No fewer than 294 illustrations are portrayed with admirable and teaching distinctness. The text and printing are clear, the paper good, and the whole a handsome volume, creditable alike to the translator and publishers.

The animal parasites of man are found nowadays to play so important a part in disease and in public health generally, especially in tropical countries, that no English-speaking medical practitioner in warm climates can afford to be without Braun's work close at hand.

New Drugs, &c.

The Valley Chemical Company, Danbury, Connecticut, U.S.A., have sent us specimens of Apetal, a stomachic tonic; Thialim, a laxative salt of lithia; Prunol, a stimulating expectorant; Taroena, the Hawaiian Health Food.

"Allenbury's" Teat.—Messrs. Allen and Hanbury, of Bethnal Green, London, E., have added an improvement to the teat of their well-known "Feeder." The teat is so fixed that it is well-nigh impossible for the child to pull it off.

Cyllin as a Disinfectant. — According to researches made by E. Klein, M.D., F.R.S., Cyllin prepared by Jeyes' Sanitary Compounds Company, 64, Cannon Street, London, is fifteen times more efficient than carbolic acid when tested against a vigorous culture of glanders.

COLONIAL CIVIL SERVICE.

Dr. G. Carnana Scicluna, Medical Officer of Health, Malta, has been promoted to the office of Chief Government Medical Officer and Superintendent of Public Health on probation for one year in place of Lieutenant-Colonel R. P. Samut, M.R.C.S., who has retired. Dr. Scicluna has also been made a member of the Executive Council and an official member of the Council of Government.

Dr. J. C. Franklin is acting as Senior Medical Officer of the Gambia during the absence of Dr. R. M. Forde, who has arrived in England.

Lisbon International Medical Congress.—The arrangements for the Congress to be held at Lisbon, in April, 1906, are now well under way. The Congress commences on April 19th and continues until the 26th, and specially arranged excursions are being advertised from London and Liverpool. Those intending to avail themselves of the privilege offered should communicate with the Travel Bureau, 29, Cockspur Street, Charing Cross, London, S.W.

THE STRAITS AND FEDERATED MALAY STATES GOVERNMENT MEDICAL SCHOOL.

Syllabus.

Patron:

His Excellency Sir John Anderson, K.C.M.G.

Council:

The Principal Civil Medical Officer (*President*).
The Secretary for Chinese Affairs (*Vice-President*).
The Honourable The Colonial Treasurer.
The Principal of the School.
The Nominee of the Resident-General: Dr. M. J. Wright, State Surgeon, Perak.
The Nominee of the Straits Branch of the British Medical Association; Dr. Lim Boon Keng, M.B., C.M. (Edin.).
The Honourable Tan Jiak Kim.
Loke Yew, Esquire.
Gan Ngoh Bee, Esquire.

President of the Council and Dean:

D. K. McDowell, C.M.G., Principal Civil Medical Officer.

Principal:

G. D. Freer, M.B.(Lond.), D.P.H.

On receipt of the Governor's reply a meeting of the leading members of the Chinese community was held in the Chinese Protectorate, Singapore, at which the Governor's offer was gratefully accepted and arrangements for the collection of the necessary subscriptions made. Over eighty thousand dollars were finally collected, twenty thousand of which were subscribed in Penang and nine thousand (in one donation) in the Federated Malay States. The Singapore Chinese, headed by the Honourable Tan Jiak Kim (who himself gave $12,000), were by far the largest subscribers.

The condition laid down by the Governor having been amply fulfilled, and the Secretary of State's approval of the scheme having been obtained, a vote was taken in the Legislative Council, and a Bill (Ordinance XV. of 1905) introduced to incorporate the Council of the School.

Under the Ordinance, "It shall be lawful for the Council to grant to such students of the Straits and Federated Malay States Government Medical School as have passed at the school an examination in medicine, surgery, and midwifery (hereinafter called a qualifying examination), diplomas as licentiates of the school."

"Every such qualifying examination shall be held at such times as the Council shall appoint and shall be conducted by a Board of Examiners nominated by the Council, of whom the majority shall be persons not employed as teachers in the school, and the standard required from candidates at any qualifying examination shall be such as sufficiently to guarantee the possession of the knowledge and skill requisite for the practice of medicine, surgery and midwifery."

"It shall be lawful for the Council to cancel any diploma granted under this Ordinance if the holder thereof shall at any time be convicted of any heinous offence or shall be guilty of infamous conduct in any professional respect."

"Every holder of a diploma as a licentiate of the School shall be entitled to be registered under 'The Medical Registration Ordinance, 1905,' or any other Ordinance for the time being in force for the registration of medical practitioners in the Colony and to practise medicine, surgery, and midwifery accordingly."

"It shall also be lawful for the Council to issue certificates of proficiency as hospital assistants or nurses to such students as shall have completed to the satisfaction of the Principal of the School such a course of instruction as may be approved by the Council."

"Semaine Médicale," September 10, 1905.

MALARIA SIMULATING ACUTE PERITONITIS. M. GILLOT.

The symptoms of this larval form of malaria are abdominal dilatation and pain, vomiting, small pulse, &c. The symptoms may occur at the invasion, or during the progress of a malarial attack, also during intermittent or remittent fevers, and as complications in other diseases. The diagnosis depends on the absence or presence of a malarial parasite from the blood, and the result of the administration of quinine, though the parasite may be absent in pernicious attacks, and in patients previously treated with quinine. Typhoid is diagnosed by Widal's reaction, and also by the blood count, which, in malaria, shows slight increase of leucocytes, whereas it is conspicuous when suppuration is present. T. P. B.

"Le Caducée," November 4, 1905.

TRAUMATIC RUPTURE OF MALARIAL SPLEEN: RECOVERY.

A soldier, aged 20, six months resident in Mostaganem, had been twice treated for malaria, with enlargement of spleen.

At two in the afternoon he was hit over the spleen with a revolver in its case. He felt severe pain at the time and he quickly collapsed; there were no other symptoms.

When seen in hospital, at ten in the evening, he was very pale, the splenic area was painful, the abdomen distended and tender, so that the patient laid on his right side. When in this attitude the more dependent part was absolutely dull. The relative dulness extended to the middle line, there was diminished resonance in the hypogastric area as far as the umbilicus, the left side of the abdomen was resonant. The spleen dulness was notably increased.

He complained of pain on the left side of the neck, which prevented him turning his head, there was tenderness on pressure behind the sternomastoid, apparently corresponding to the course of the phrenic nerve. No pulse could be felt in any artery, but only a tremor in the carotids.

On admission 200 cc. of a 1 per cent. gelatine serum and 10 cc. antitetanic serum were injected.

At half-past eleven the patient had improved, the pulse could be felt: 150 cc. of gelatine serum was injected. During the night the patient vomited twice, and slept for an hour.

Next morning the pulse was 110, soft, but regular; the temperature was 35·6° C., and 38.4° C. in the evening. He could turn on to his back, when the sides of the abdomen were found to be dull, especially the right. The pain in the neck was less.

The dulness, pain, and distension of the abdomen lessened; the pain over the spleen continued. The temperature was raised, reaching its highest point, 39·4° C. on the fourth day, and oscillated between 37° C. in the morning and 38° C. at night, finally remaining normal on the nineteenth day.

EXCHANGES.

Annali di Medicina Navale. Annali d' Igiene Sperimentale Archiv für Schiffs u. Tropen Hygiene. Archives de Médicine Navale. Archives Russes de Pathologie, de Médec. Clinique et de Bacteriologie. Australasian Medical Gazette. Boletin de Medicina Naval. Boston Medical and Surgical Journal. Bristol Medico-Chirurgical Journal. British and Colonial Druggist. British Journal of Dermatology. British Medical Journal. Brooklyn Medical Journal. Caducée. Climate. Clinical Journal. Clinical Review. Giornale Medico del R. Esercito. Hong Kong Telegraph. Il Policlinico. Indian Medical Gazette. Indian Medical Record. Indian Public Health. Interstate Medical Journal. Jahresbericht. Janus. Journal of the Royal Army Medical Corps. Journal of Balneology and Climatology. Journal of Laryngology and Otology. Journal of the American Medical Association. La Grèce Médicale. Lancet. Liverpool Medico-Chirurgical Journal. Medical Brief. Medical Missionary Journal. Medical Record. Medical Review. Merck's Archives. New York Medical Journal. New York Post-Graduate. Pacific Medical Journal. Polyclinic. Public Health. Revista de Medicina Tropical. Revista Medica de S. Paulo. Sei-i-Kwai Medical Journal. The Hospital. The Northumberland and Durham Medical Journal. Transactions of the American Microscopical Society. Treatment. West India Committee Circular. West Africa.

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Notices to Correspondents.

1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the JOURNAL OF TROPICAL MEDICINE should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communications.

REPORT ON THE DENGUE EPIDEMIC IN BRISBANE IN 1905.

At the meeting of the Queensland Branch of the British Medical Association, held on April 7th, a Committee, consisting of the President (Dr. Robertson), and Drs. Thomson, Love, Turner, and Wield, were appointed to draw up a report on the epidemic of dengue fever.

Dengue appears to be endemic in the Eastern Tropics. In the summer of 1897-8 an epidemic of the disease occurred throughout the coastal district of Queensland, and in Brisbane attacked a very large proportion of the population.

In the summer of 1905 Brisbane has suffered from a second epidemic, which has also been wide-spread in the State from the extreme north to its southern boundary, and extending also westward to the railway termini. The differences between this and the former epidemic are relatively small, in the main the symptoms are identical, the chief differences being in the relative frequency of certain symptoms, such as the rash, the gastro-intestinal symptoms, &c.

The epidemic commenced towards the end of December, and disappeared in June, lasting barely six months.

Origin and Mode of Spread.—There appears to be no room to doubt that the epidemic was imported from the north. It is undoubtedly highly infectious, but clinical observation does not enable us to form any definite opinion as to the mode in which the infection is conveyed from person to person. In some respects the spread of the disease suggests some peculiarity in the method of propagation differing from that of the well-known diseases, influenza, scarlet fever, measles, &c. It appeared to spread particularly to contiguous houses, whole streets being attacked *seriatim*.

One observation appears to have some bearing on the method of propagation. That is, the medical men have, in many instances, appeared immune to the disease, although exposed to it daily, indeed hourly, until cases appeared in their own households, when they fell victims, being usually among the last members of the households to be attacked.

Similar facts have been reported as to employees in city warehouses.

Earliest Cases.

The earliest case reported to us occurred on November 24th, on the outskirts of the Spring Hill district, and another on December 2nd by the same observer in Swan Hill district. These appear to have been isolated cases; the first outbreak in an epidemic form occurred in the Spring Hill district near the end of December, The disease raged there throughout the month of January, while only a few isolated cases were reported from other districts, until early in February, when it appears to have established itself in fresh centres, and soon prevailed universally, both in the city and suburbs. In the appendix will be found further particulars.

Extent of the Epidemic.

No other epidemic disease attacks such a large proportion of the population. Among the medical profession the impression prevails that it is not an exaggeration to estimate that more than three-fourths of the population have been attacked. When the disease has entered a house, in the large majority of instances all the inmates are attacked sooner or later; it was the exception for one or two to escape, though this occurred sometimes.

From the records given in the appendix as to the prevalence of the epidemic among the Civil Service, employees of several large business firms, and others, it appears that the incidence of the disease in these instances was from about 80 to 90 per cent. These figures probably do not include some of the mildest attacks, as in most instances they refer only to those who were absent from duty. In a suburban return (Belmont) the proportion is lower, about 70 per cent.

Of thirty-three married men attacked in the Defence Force, in twenty-five instances their wives also had the disease, and of their fifty-nine children, fifty-seven were attacked.

On the Island of St. Helena in Moreton Bay, which is used as a convict station, the majority of the warders who were exposed to infection by visiting town were attacked, but the disease only spread on the island to a small extent. Among ten persons belonging to the families of the staff, who did not leave the island, five were attacked, that is, 50 per cent. But of 195 prisoners only five had the disease—2·5 per cent.

Even isolation in the city gaol had a marked influence on the number of cases, as is shown by the following return :—

Boggo Road Gaol.		No.	Attacked.	Per cent.
Male division.	Warders	12	10	83·3
	Prisoners	155 (average No.)	32	20·6
Female division.	Warders	5	5	100
	Prisoners	40 (average No.)	29	72·5

Incubation Period.

It has been very difficult to gather reliable evidence under this head, owing to the multiplicity of possible sources of infection. The general impression seems to be that the period of incubation is from three to six days. There are good grounds for believing it may be as short as twenty-four hours.

The following cases give more definite information :

Dr. Lockhart Gibson : Dwelling five miles from Brisbane, a quarter of a mile from nearest neighbours. Groom had only two opportunities of contracting dengue within a week of his attack. On Monday, horse-feed brought by a man convalescing from dengue. On Wednesday attended a sports meeting in town. Thursday evening, malaise and fever; sent to hospital next day. Discharged Saturday week, after having had a normal temperature for two days, and on the Monday evening following returned to his situation. On the Wednesday evening the cook noticed to have a temperature. She had had no other opportunity of contracting dengue for fully a week previously. Both cases had fairly severe attacks.

Dr. Faulkner : A woman at a solitary farmhouse ten miles from Toowoomba was suddenly seized with the

the initial rigor of an attack of dengue one evening. Exactly twenty-four hours before, a nurse, who was convalescent from dengue, arrived from Brisbane, and slept in the same room. There had been no cases of dengue previously in the house, and as far as could be ascertained there was no other possible source of infection. Seen a few hours before the arrival of the nurse, she showed no symptoms of dengue.

Dr. Little: A servant girl was away for ten days in the bush. On her return she contracted dengue within forty-eight hours.

Dr. Love: A nurse arrived from Southport, where there were no cases at the time; went to Lady Musgrave Lodge, where there was dengue; left same day to nurse a case and fell ill on the third day after arrival, though there was no dengue in the house she went to.

Dr. Wield: A young woman came from Helidon, where there was no dengue, arriving on Friday at 1 p.m.; stayed at an infected house and developed the disease on Tuesday morning.

Dr. Brockway: Mr. W. and two daughters landed in Brisbane from England on April 4th, and on April 8th they all showed symptoms, somewhat suddenly, of dengue.

Age Incidence.

All ages are attacked. The disease has been observed within a few days of birth. Infants usually contract the disease after the mother, but in one or two instances a baby at the breast was the first in the house to be affected. Occasionally suckling infants lying in bed with their mothers, who are suffering from dengue, escape the disease.

Vigorous adults suffer most during the attack. Those previously in weak health are more liable to prolonged and retarded convalescence.

The aged and infirm usually have the disease mildly, sometimes very mildly. A striking instance of this was furnished by the Diamantina Hospital for Chronic Diseases, which contains a large proportion of old people over seventy, and others debilitated by advanced rheumatism, paralysis, cancer and phthisis. Of these two-thirds took the infection, but there were no deaths and no serious cases (excluding the phthisical patients). The proportion attacked may have been larger than two-thirds, as in many the symptoms were so mild as to be scarcely recognisable. Healthy nurses suffered more severely than the patients. On the other hand, several phthisical patients had their tubercular disease aggravated and death accelerated.

General Sketch of the Symptoms.

Among the thousands of cases that came under observation there have been observed many rare and exceptional symptoms and complications. Lest the enumeration of these induce a false impression, it may be well to give a preliminary sketch of the prominent features of the great bulk of the cases. The onset is usually sudden, the initial rise being attended occasionally by a suffusion of the face, known sometimes as the initial eruption. Suffusion of the eyes with often slight photophobia are the rule at this stage. Sometimes the onset is attended by shivering. The pulse is not as a rule accelerated in proportion to the temperature, and may even be slowed. The initial rise of temperature is attended usually by severe headache, as a rule frontal or post-orbital, which, however, is often slight or absent in children. Severe pains, most marked in the lumbar region, but also affecting the limbs, are present in most adult cases. Anorexia is as a rule complete. The tongue varies; it is often densely furred, but may be clean and moist. In many cases abdominal pain and retching are a marked feature. On the third or fourth day there is a remission of the temperature, which sometimes falls to normal. A terminal rise succeeds the remission in typical cases, and is usually accompanied by marked aggravation of the pain in back and limbs, and increased prostration. The characteristic eruption usually appears after the remission and consists of a punctate roseolous eruption, often evanescent, very variable in its extent, and to some degree in its character, but frequently absent even in well-marked attacks. In young childen, who as a rule suffer less from other symptoms than adults, the rash is more prominent. The temperature usually falls abruptly at about the end of the fifth period of twenty-four hours after the invasion. With the fall all the symptoms ameliorate, but do not disappear for another two or three days, or perhaps longer, the tongue, when furred, often being slow to clean, and the distaste for food often continuing after the patient has improved in other respects. The respiratory system is notably free from implication. Complications and sequelæ are infrequent, though loss of strength and general prostration are often rather severe after an attack, and strength is slowly regained.

Onset.—This is sudden in the great majority of cases, being comprised within a few hours. In some well-authenticated instances it is dramatically sudden, the patient being able to point to the actual minute which separated a consciousness of good health from well-marked sensations of fever, headache, general pains, and prostration. Occasionally the patient complains of slight symptoms—headache, prostration, muscular pains—for one or two days before the initial rise of temperature.

Shivering, rarely amounting to actual rigor, is common during the initial rise of temperature.

Temperature.—The average range of temperature had its highest point between 102° and 103°, in a smaller proportion it reached 104°, and cases with temperature above this point were exceptional.

The duration of the temperature was seldom over five or six days, and the prophecy that the temperature would fall at or soon after the end of the fifth period of twenty-four hours after the onset was seldom falsified, though cases of longer duration were observed. In one typical case the temperature lasted two weeks, and fell by crisis, without any complication to account for its long continuance.

The initial rise of temperature was usually moderate, not over 102°, and was in the majority of cases succeeded by a fall on the third, less often the fourth, day, sometimes to normal. This remission or intermission would last a few hours, and would be succeeded by a terminal rise lasting one or two days, during which the temperature would reach its greatest

height, falling by crisis to the normal soon after the patient had appeared to be at his worst.

Hyperpyrexia.—Temperatures over 105° have been noted, but only in a small minority. For instance, a child, aged 3, with extremely developed universal rash, had for some hours during the night a temperature of over 106°, with a weak running pulse, but recovered. A girl, aged 16, had a temperature of 106° in the mouth at the onset of the attack. A girl, aged 6, had a temperature almost 107° shortly after admission into hospital; it fell rapidly after tepid sponging. Several fatal cases in children had hyperpyrexia.

Pulse.—As a rule the pulse is slow in comparison with what would be expected from the rise in temperature. It is common to have a pulse of 75 to 80 with a temperature of 102° or 103° during the first two or three days. Towards the close of the attack the pulse may be more accelerated. There are exceptional cases in which the pulse is accelerated at the outset, and they usually occur in weakly subjects. Several cases have been observed in which the pulse sank to 44 or 48 during or after the second day, with continued pyrexia.

Headache.—This symptom is present in nearly all adult cases, and is usually severe. Post-orbital or frontal headache is the most common form, but there is sometimes also severe parietal or occipital headache, which may be accompanied by hyperæsthesia of the scalp. The eyeballs may be tender to pressure. In some cases there is pain on movement of the eyes, apparently dependent on affection of the ocular muscles. In this condition the patient endeavours to keep the eyes fixed, as any movement of them causes suffering. One case had diplopia accompanied with pain.

Muscular Pains.—Most adults suffer from severe backache, apparently located in the lumbar muscles. This symptom may be present at the invasion, or may appear later than the headache, and is usually more persistent. Often the patient complains of it bitterly. Less frequently the pain is felt more in the interscapular region. Hyperæsthesia of the skin of the back has been observed. Intercostal and abdominal muscular pains are frequent, and are sometimes the symptoms most complained of. Sometimes these pains are specially referred to the scars of old abdominal operations. In many cases muscular pains are felt in the limbs, especially the calves.

Particular Pains.—These are frequent, more especially in or about the lower ends of the femora. Possibly some of the back pains are of this character. They are certainly not in the joints, and are not at all aggravated by movement, and could not be confused with the pains of acute rheumatism. They consist of a dull aching, more or less severe, the sensation suggesting either affection of the bone-ends or of the deep insertions of the muscles or ligaments.

One medical man had marked hyperæsthesia of the skin around one knee-joint.

Sometimes there are shooting pains in the hands and feet.

The very severe limb pains of "break-bone" character have been observed in this epidemic, but only in comparatively few cases.

Initial Eruption.—In many cases there is a flushing of the face, sometimes blotchy, and sometimes spreading into the neck. It appears in the first twenty-four hours, and soon disappears.

Suffusion of the conjunctivæ, and sometimes evident congestion, are very common at the outset. With this there is often some photophobia, slight in degree. These symptoms are less marked than in measles.

Nasal catarrh has been markedly absent.

Sore throat is sometimes complained of, but on inspection only a moderate degree of congestion is observed.

Some observers have noticed a rash on the soft palate.

Tongue.—The condition of the tongue varies between very wide extremes.

In many cases the tongue is rapidly furred, and on the third day may be as thickly coated as that of a neglected typhoid patient in the third week. The furred tongue may become brownish and rather dry on the dorsum, but a markedly dry tongue has not been observed. In many the tongue remains moist, flabby, perhaps teeth-indented, the fur often looking like a moist coat of whitish or yellowish paint.

On the other hand, many patients retain a clean, moist tongue, according to some observers (the majority), and this condition may be present in severe cases, with a high degree of gastric irritability.

Most patients complain of an objectionable taste, variously described as a "fœtid taste," "bitter metallic taste," or "soapy taste," intensified by taking food.

The furring of the tongue, if present, sometimes remains several days after defervescence, and may be very slow to clean. The objectionable taste may disappear still more slowly. The sensation of flavour, particularly of such things as tea and whiskey, is perverted.

Larynx.—A dusky redness of the larynx, nasal mucous membrane, and nasopharynx is characteristic, and may persist for a week or longer after convalescence.

Salivary Glands.—These are not enlarged, and there is no salivation.

Lymph Glands.—These are not enlarged as a rule, but enlargement of the cervical glands is not uncommon. Sometimes the femoral, inguinal and axillary glands are enlarged. Occasionally the glands most enlarged are tender, but the tenderness is not acute. The enlargement is always discrete, and there is no periglandular thickening nor tenderness.

Liver.—Enlargement of the liver and jaundice were not observed.

Spleen.—No clinically recognised enlargement was observed.

Lungs and Bronchi.—The absence of respiratory complications is a conspicuous feature. Sometimes slight bronchitis appears in those previously disposed towards bronchitic attacks. More than one observer has noticed this to be occasionally associated with rusty sputum not due to pneumonia. In a few cases —not phthisical—hæmoptysis was observed of uncertain origin. An irritable cough, probably laryngeal, was sometimes observed.

Several practitioners and others have noticed a

peculiar odour in the patients' breath. Others note a sour, acid smell, probably of the perspiration, but different from that of rheumatism.

Heart.—No endo- or pericardial affection is observed, though præcordial pain is common. There have been a few cases of threatened or actual heart-failure from affection of the heart-muscles or nerves. Cardiac weakness is sometimes noticeable during convalescence. The condition of the heart should be carefully watched, especially in patients past middle life.

Stomach and Bowels.—Complete anorexia is the rule, and there is consequently considerable loss of weight. A few exceptional cases have continued to take ordinary food through the attack, but anorexia is usual even in slight seizures.

Thirst is not marked as a rule.

Vomiting and retching occur in a considerable proportion of the cases, both as early and late symptoms or throughout the attack, fortunately not in the majority. They are the most troublesome symptoms when they occur, and rapidly reduce the patient to prostration. The retching may be frequently repeated without actual vomiting, the nourishment given being retained and only a little clear liquid being brought up.

Gastric pain appears to be present, sometimes quite distinct from that in the abdominal wall. It is much aggravated by flatulence, and may be very acute. A feeling of oppression in the stomach is perhaps more common than actual pain.

Colicky pain with tenderness resembling appendicitis has been observed.

Constipation is the rule, but some few suffer from diarrhœa with mucous or dysenteric evacuations. One patient developed on the fourth day a severe attack of dysentery which gave great anxiety, and kept him an invalid for two months.

Nervous Symptoms.—Headache is present in almost every case, except in children, in whom it is usually slight or absent.

Insomnia is a common symptom, and is often that most complained of. Children, however, are usually drowsy while the fever lasts, and this may be the case in adults.

Persistent and annoying dreams are complained of by some patients.

Delirium is less than would be expected from the intensity of the fever. Very rarely there is severe delirium. Sometimes there are hallucinations. In children convulsions may come on with the initial rise of temperature (rarely later), especially in those under five years. One infant of ten weeks had fatal convulsions with hyperpyrexia on the fourth day.

Depression varies much in different patients. It is usual after the third or fourth day, and during convalescence.

Mania was observed in two cases; hysteria in several.

The poison of dengue appears to have a special action on the peripheral nerves, and doubtless this is the explanation of the very various pains which are so common, often severe, and occasionally unbearable. That this is so is confirmed by the cases of cutaneous hyperæsthesia. Affection of the motor nerves is seldom observed, but the case of diplopia can hardly be otherwise explained. Among the sequelæ peripheral neuritis is noted, though in but few cases.

Hæmorrhages.—Epistaxis occurs sometimes, more often in children, and may be profuse.

Hæmatemesis has been rarely observed in the present epidemic.

Hæmoptysis has been already noted as occurring in a few instances.

Hæmaturia has been observed once or twice in patients with previously healthy kidneys.

Subconjunctival and retinal hæmorrhages are also of rare occurrence.

Several cases of cerebral hæmorrhage took place during attacks of dengue.

One case had subcutaneous hæmorrhage in one leg, accompanied by effusion of blood into the ankle-joint.

Some degree of increased menstrual loss is the rule, and may amount to menorrhagia. The period is also usually accelerated.

Renal Functions.—Albuminuria is not often observed, but there have been several instances of a fair quantity of albumin appearing during the attack, and disappearing soon after defervescence. In one case it did not disappear for two or three weeks.

In some cases the urine is extremely scanty, high-coloured and loaded with urates.

One case is reported of a non-pregnant woman in whom dengue was accompanied by albuminuria and convulsions. The patient recovered, and the albumin disappeared during convalescence.

Another case was a woman over 80 who had previously suffered from high arterial tension and infrequent pulse without albuminuria, but developed 5 per cent. of albumin with the onset of dengue, the albumin disappearing a few days after defervescence.

Several other similar cases could be quoted, and probably albuminuria occurs more often than is suspected. One case of adolescent albuminuria was apparently cured by an attack of dengue.

Terminal Rash.—This appears on the fourth or fifth day, and is often first observed just before or after the crisis. It may, however, appear earlier. In many cases the rash is slightly developed and evanescent. In this epidemic a large proportion of patients, placed by some at one-half or more, have had no rash. There is, however, some difference of opinion on this point, and some would place this proportion lower. This appears to be due partly to the greater diligence displayed by some in searching for a slight and fugitive rash; partly by their recognising slight appearances, which others would not consider to be distinct eruptions. While no rash has been observed in some severe cases, it has been usually absent in mild cases, except in children, in whom its absence is infrequent.

The usual rash is an eruption of minute red spots, smaller, less raised, and brighter red than that of measles, but considerably larger, more discrete, and not so vividly red as that of scarlet fever. On the whole, it has most resemblance to the eruption of rubella. Its favourite sites are the upper part of the chest, back, extensor aspect of limbs about elbows and knees, and the front of the forearms. In a minority the rash affects the palms and soles as a carmine-pink

suffusion, which is extremely characteristic. More rarely the rash in these parts may be punctiform.

In children the rash is occasionally universal, the face included, and largely confluent, so that, although commencing differently, it comes to resemble a highly developed scarlet fever rash.

In most cases the rash on the palms and soles is extremely itchy, that on other areas is less frequently so. The itching persists after the rash has disappeared for a day or two. If the rash is much developed it is followed by desquamation, which is most marked on the hands and feet. In one child with an extreme rash the desquamation was in flakes, the cuticle separating from the fingers and toes like glove-ends.

In some cases the rash varies from the common form. In a few severe cases there has been a dusky rash of discrete spots widely distributed over the trunk and limbs, lasting several days, and somewhat suggestive of measles.

A scarlatiniform rash has been seen in a few cases by several observers.

An urticarial rash: an eruption of urticarial wheals has replaced the usual rash in one or two cases.

A petechial rash: one case is reported.

(No sporadic cases of measles or scarlet fever have been noticed during this epidemic.)

Relapses and Second Attacks.

An attack of dengue during the previous epidemic had no or very little protective influence in this one.

Though dengue usually runs its course within five or six days, cases have occurred in which fever continued for ten days or more, often with a remission, sometimes with two outbreaks of the rash, and these may be looked on as cases of relapse. In others several days or a week of normal temperature intervene. Between these cases and second attacks no line can be drawn.

Second attacks have occurred at intervals up to three months. As a rule these have been severe, and have followed mild attacks, but the contrary has been observed.

Complications.

Pneumonia and pleurisy are very rare complications; a few cases have been observed.

Parotitis has occurred also in a very few. Orchitis was noticed in several cases.

Ulceration of the mucous membrane of the mouth and gingivitis was occasionally noted; in one case this was followed by fatal tetanus. Superficial ulceration of the fauces is also recorded.

Diarrhœa, sometimes with mucous evacuations, is not very infrequent.

Dysuria occurs now and then, but actual retention is very rare.

Pregnancy in most cases has not aggravated the disease, but there has been a tendency to miscarriages and premature labours. In some of the latter instances the children were still-born. Dengue in the puerperium does not seem to have been specially harmful.

Sequelæ.—Boils and carbuncles have not been very uncommon sequelæ. An itchy vesicular eruption on the fingers and palms of the hands is occasionally troublesome. Two cases had widespread eczema. Women frequently complained of shedding of the hair during convalescence, and cases were noticed in which the hair went rapidly grey.

A special proclivity to X-ray burns was noted in two patients after attacks of dengue. Perfectly similar exposures with the same tubes had been previously well borne by them.

Muscular rheumatism, including backache and inframammary pain, was sometimes persistent.

Three cases of synovitis of the knee are recorded.

Mastitis occurred in two cases; neither suppurated.

Venous thrombosis, sometimes ending in suppuration, was a very rare sequelæ.

One case of gastritis is recorded. Also one of diabetes.

An adult (aged 35) who had previously suffered from slight albuminuria and slight cardiac hypertrophy, suffered from repeated attacks of heart-failure after the subsidence of dengue. He had never had such attacks previously.

Another case had persistent and troublesome palpitations without cardiac lesion.

Keratitis and corneal ulceration occurred both as complications and sequelæ, but fortunately in a very small minority of cases. Dr. Lockhart Gibson reports some interesting cases, which are given in an appendix. Asthenopia was sometimes noted for the first time, or aggravated. In one case optic atrophy, probably from retrobulbar neuritis, supervened.

Neuralgias are not uncommon. Slight symptoms of peripheral neuritis were noted by several observers. Usually numbness was the most prominent symptom, accompanied by some paresis, and perhaps by loss of knee-jerks.

Giddiness was sometimes complained of. Nervous depression and loss of memory sometimes persist after the attack. Loss of memory for words, and a tendency to misplace letters in writing, are recorded by two observers. In one or two cases the nervous depression progresses to melancholia, which subsequently cleared up.

Dengue Complicating Previously Existing Diseases.—In nephritis the quantity of albumin is increased, and in a few uræmia supervenes. But many cases of nephritis go through the disease without apparent harm.

One case of diabetes had fatal coma.

Cases of phthisis often go to the bad after an attack of dengue.

Skin diseases are aggravated; so is previously existent neuritis.

Any ulceration, especially varicose, is apt to spread.

Mortality.

In the return kindly furnished by the Government statistician, which will be found appended to this report, ninety-four cases are reported to have died from dengue in Brisbane, among a mean population of 125,672. The great bulk of the mortality occurred during the months of March and April, during which it considerably swelled the the general mortality. If it be assumed that one-half the population were attacked, this would correspond to a case mortality of 1 in 668; if 75 per cent. were attacked, which is probably under the mark, to a case mortality of 1 in 1,000. The mortality was relatively greater in

females than males. The highest mortality occurred at the extremes of life, those under 5 years of age contributing 37·6 per cent., and those over 60 years 35·5 of the total.

The mortality returns probably give an exaggerated idea of the immediate fatality of the epidemic. The overwhelming majority of those attacked are never in a condition to give rise to any anxiety. Some medical practitioners with large practices have seen no deaths, others only a few. In the Brisbane Hospital, out of 566 cases admitted (and therefore, no doubt, selected as being severe cases) there was only one death.

As a result of enquiries we are indebted to several medical men for particulars regarding the fatal cases occurring in their practices, and adding to these those that came under our own observation, we have collected thirty-five fatal cases, of which one occurred in Toowoomba, eight in Ipswich, and the remainder in Brisbane.

Under Five Years.

Children's Hospital: A child, aged 3, developed hyperpyrexia with some convulsive seizures on the fifth day. The temperature resisted antipyretic measures. Death occurred from heart-failure within twenty-four hours.

Dr. Bancroft: A feeble infant, aged 6 months, was seen with a slight rash, temperature of 101°, and vomiting, and died suddenly on the same day.

Dr. Kerr-Scott: A healthy female infant of 10 weeks took convulsions with hyperpyrexia on the fourth day, and died in six hours.

A female infant of 10 months developed bronchitis on the sixth day. Sudden and unexpected death from syncope on the ninth day.

Dr. Brockway: An infant of 5 days developed a copious rash, refused the breast, and died.

Dr. Turner: A boy, aged 2, was seen about the fifth day with a slight rash and great prostration. Died from heart-failure next morning.

A girl, aged 4, who had suffered many months from chronic lead poisoning, but had improved, died of long-continued convulsions, which were probably uræmic. They came on a few days after temperature had fallen.

Dr. Halford: Female twins, aged 11 months, both delicate from birth, bottle-reared. Had been subject to gastro-intestinal disturbances, and contracted dengue about one month before death from exhaustion. Both cases were complicated by staphylomatous ulceration of corneæ.

Dr. Cameron (Ipswich): Girl, aged 4, suddenly seized with fever, restlessness, pains all over. Next morning convulsions, which lasted until death, twenty-four hours after onset. Mother was in bed with dengue, and father had had it a few days before, so that it was inferred that the child was suffering from the same. It was apparently healthy, but had had convulsions on two previous occasions.

Male infant, aged 8 days. Mother suffering from dengue when confined. Baby healthy at birth, suddenly became febrile and died after a few hours' convulsions. Probably dengue.

Male infant, aged 11 months. Severe attack, on third day repeated convulsions, high fever, and death.

Infant of 17 months. Fatal convulsions on second day.

Between Five and Sixty Years.

Dr. Kerr Scott: Female, aged 29. Advanced phthisis, dengue, and exhaustion.

Dr. Love: A stout man, aged 55, who had previous symptoms of cardiac weakness, died of sudden heart-failure shortly after the subsidence of dengue.

A child, aged 8, had persistent vomiting after dengue, and died of exhaustion.

Dr. Thomson: A lad who had been a cellarman, and drank freely, died of cerebral hæmorrhage within forty-eight hours after getting out of bed.

Dr. Hawkes: Woman, aged 28, two and a half months pregnant, had a severe attack of dengue, temperature 103° to 104°, within twenty-four hours had uterine hæmorrhage. When seen on third day had offensive discharge, uterus tender and soft. On fourth day uterus emptied by finger and soft blunt curette. Uterus flabby and almost impalpable, very little hæmorrhage. Did well for three days and then died with symptoms of pulmonary embolism within a few minutes.

Woman, aged 53, who had probably had a fatty heart for some years, on third day had cardiac pain, dyspnœa, acute dilation of the stomach, and died in a few hours.

Dr. Turner: A woman, aged 46, who had been under treatment for some months for anæmia, with subcutaneous hæmorrhages, complicated by hæmaturia at first, and later by albuminuria without blood, had suppression of urine and fatal convulsions on second day after temperature had fallen to normal.

Dr. Halford: Married woman, aged 42, had on fourth day severe abdominal pain and collapse. When seen on the fifth day nothing could be found to account for symptoms; died soon after.

Man, aged 24, died of phthisis accelerated by dengue.

Dr. Cameron (Ipswich): Man, between 30 and 40, had a moderately severe attack, keeping him in bed a week. Two days after getting up had difficulty in walking, inco-ordination of legs, loss of knee-jerks, no impairment of sensation. He was not seen again, but died a week later.

A very stout woman, aged 50, had severe dengue, with persistent vomiting and diarrhœa. Died of heart-failure; probably heart was fatty.

Dr. Faulkner (Toowoomba): Man, aged 35, a baker, had been much overworked owing to illness of employees. Dengue with extremely severe vomiting and diarrhœa, aggravated by injudicious diet; died of exhaustion on the thirteenth or fourteenth day, though his temperature had come down.

Over Sixty Years.

Dr. Kerr-Scott: A man, aged 68, who had suffered from diabetes for several years, became extremely weak and died on the fifth day.

A woman, aged 80, had dengue, complicated by nephritis on the fourth day. Died on the seventh day from heart-failure after almost complete suppression for twenty-four hours.

Dr. Bancroft: A feeble old woman, aged 70, died

from cerebral hæmorrhage; had had an attack some years previously.

A feeble old man, aged 70, subject to fainting attacks, died after a week's illness.

A case, aged 75, suffering from cardiac disease, died of syncope.

Dr. Thomson: A feeble old woman who had had a weak heart, died suddenly.

Dr. Hawkes: Female, aged 78, had had mitral disease with enlarged, degenerated heart. On fourth day had an anginal attack, followed by a fatal seizure a few hours later. Urine albuminous before the dengue for some time.

Dr. Halford: Woman, aged 75, subject to chronic bronchitis and dilation of right heart; gradually developed broncho-pneumonia, and died about three weeks after contracting the infection.

Dr. Cameron (Ipswich): Female, aged 74, severe attack, persistent, uncontrollable vomiting, then diarrhœa.

Male, aged 63, healthy; dengue and diarrhœa, finally passing almost unmixed blood; ill two weeks.

Some General Remarks on Dengue.

In its occurence in wide epidemics, its rapid diffusion, the large proportion of the population attacked, and very closely in its symptoms, and their comparatively short duration in most cases, dengue closely resembles influenza.

The usually sudden, sometimes instantaneous onset, the severe headache, backache and limb pains, the pyrexial symptoms, and many of the complications and sequelæ are common to both. The rash of dengue, which is, however, not a constant symptom, is sufficiently distinctive, but of even more importance is the almost invariable absence of catarrhal symptoms of the respiratory tract, and the extreme rarity of pulmonary complications.

At the outset of an epidemic of dengue, it is very commonly mistaken for influenza, and often it is not until the practitioner has seen several cases with a rash that he revises his opinion. In future, supposed outbreaks of influenza occurring in Queensland during the hot season will be rightly regarded with suspicion.

The initial symptoms of yellow fever, a disease fortunately unknown in this part of the world, closely resemble those of dengue as far as the stage of remission. In dengue, too, there is a comparatively slight but real tendency to hæmorrhages of various kinds, including hæmatemesis.

In Brisbane the symptoms of dengue have been observed free from any complication with malaria. We understand that in the North of Queensland some confusion has occurred from the intercurrence of the two diseases.

Judging from the experience of our two epidemics, and from those recorded elsewhere, dengue, like other infectious fevers, appears to vary somewhat in type. The proportion of severe cases, and the relative frequency of many of the symptoms and complications are not always the same, but dengue appears to be for all that a disease as distinctive, and as easily diagnosed when it prevails in the epidemic form, as the other exanthemata.

Appendix I.

Statistical Office, Brisbane,
June 21st, 1905.

Sir,—In accordance with your personal request, I have much pleasure in quoting particulars relating to the mortality from dengue fever during the first five months of this year, as recorded in this office. The details are as follows:—

Metropolitan Area (10 Miles).

Month	Population, Dec. 31, 1903	Total Deaths	Deaths from Dengue Fever					
			Under 5	5 to 20	20 to 40	40 to 60	Over 60	Total
January	125,672	M. 76	..	..	..	..	..	..
		F. 40	..	..	..	..	..	
February ..		M. 63	..	..	1	..	1	2
		F. 55	..	..	..	..	..	
March		M. 85	2	..	2	..	10	39
		F. 96	11	1	2	4	7	
April		M. 81	11	..	4	1	6	43
		F. 61	5	3	2	4	7	
May		M. 68	1	..	1	..	1	9
		F. 57	5	..	..	..	1	
Total		M. 373	14	..	8	1	18	..
		F. 309	21	4	4	8	15	
		682	35	4	12	9	33	93

I have the honour to be, Sir,
Your obedient servant,
(*Signed*) Thornhill Weedon,
Government Statistician.

Dr. A. J. Turner,
Wickham Terrace, Brisbane.

P.S.—One death from dengue, that of a male, aged 60, was reported in June; none in July.

Appendix II.

Dr. Lockhart Gibson reports three cases of keratitis during dengue, and five cases (three adults and two children) occurring immediately subsequent to the attack or during convalescence.

The latter he considers to be examples of "keratitis neuro-paralytica" from neuritis of the corneal terminations of the ciliary nerves. A triangular area, with its base at the corneal margin and its apex at or beyond the corneal centre, is involved, and becomes insensitive. Some of the cases are serious, and all are extremely slow in recovering, owing, doubtless, to persistence of the neuro-paralytic state of the cornea.

In the cases of keratitis observed during the actual attack, in each case an irregular and prolonged one, he considers that, in addition to keratitis neuro-paralytica, there was infective ulceration of the cornea, probably directly induced by the infective organism of dengue. Of four eyes involved, one cornea, an adult's, became entirely destroyed. In two other cases, twins aged 10 months died from prolonged attacks of dengue, with recurring hyperpyrexia. Prior to death one cornea of one became staphylomatous, and each cornea of the other had a large perforation, due to the formation and separation of a slough.

so that the delicate needle, supported in its groove, is protruded, and forced into the tissues of the victim. In all these forms, the gnats included, suction is effected by the pumping action of an expansion of the pharynx contained within the head, which can be actively dilated by means of powerful muscles.

In the true flies the food passes from the pharynx into a large, thin-walled crop, placed in the anterior part of the abdomen, from which it is regurgitated, little by little, through a valvular organ, known as the proventriculus, into the mid-gut for leisurely digestion. In the gnats, however, the crop has ceased to function as such, and is transformed into a pneumostatic organ by the enormous development of the tracheal supply of its walls, so that the increase of the insect's weight, when heavy with food or eggs, can be met by a proportionate increase of its bulk. All forms are furnished with modified salivary or poison glands, which discharge by a common median duct at the extremity of the pharynx directly into the tissues of the victim. The action of the secretion is, no doubt, to keep the blood fluid and stimulate its flow, but repeated personal experience has convinced me that, in the mosquitoes at least, its primary action is anæsthetic, and that the subsequent irritation does not, as a rule, commence until the insect has flown safely away.

"Journ. Amer. Medical Association," September 2, 1905.

I.—Cysts of the Spleen. W. A. Bryan, M.D.

Bryan classifies splenic cysts into: (1) Dermoid cysts characterised by being lined by epithelial cells. (2) Simple serous or blood cysts, believed usually to be due to extravasation of blood, which has taken place either immediately beneath the capsule or in the substance of the spleen. (3) Echinococcus cysts. Splenic cysts when small present no symptoms, but as they advance in size and attain adhesions, their presence is indicated by pain and fulness in the left hypochondrium. Of 17 cases, of which careful notes are available, 5 were ascribed to injury, 5 to malaria, and in 2 cases malaria and injury were recorded.

Treatment.—Splenectomy is called for when the splenic tissue, owing to the cyst, is considered organically useless. When adhesions forbid complete removal, and when the cyst has not destroyed the splenic tissue altogether, the sac must be opened and drained. Exploratory punctures of the spleen are to be condemned in cases of cysts of the organ.

II.—Indications for the Removal of the Pathologic Spleen. B. B. Davis, M.D.

Davis, in his summary of indications for removal of the spleen, states:—

(1) Splenectomy is contraindicated in leukæmia, amyloid spleen, hypertrophy secondary to hepatic cirrhosis, secondary malignant disease, and in essential anæmias.

(2) Splenectomy is indicated in cysts, benign tumours, tuberculosis, sarcoma, rupture when extensive, malarial spleen, and in splenic anæmia, when the organ is very large and other treatment fails.

In wandering sleen, splenectomy is usually preferable to splenopexy. In abscess of the spleen drainage is preferable to removal of the organ.

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THE

Journal of Tropical Medicine

December 15, 1905.

IS MALTA FEVER PECULIAR TO MALTA?

The name Malta fever has been regarded as one of those irregularities in regard to nomenclature with which we are familiar. Up to quite recent years almost every district or even town in warm countries had its own specially named form of illness which was regarded as specifically belonging to the place. Since the parasites have been discovered, and the diseases have been submitted to accurate tests, there are but few of the names we are familiar with that will stand the criticism. "Rock fever," "West Coast fever," "Delhi boil," "Biskra button," "Hong Kong dog," "Shanghai fever," for example, have no title to the geographical limits placed upon them by their baptismal names, and there are no doubt many others that will disappear in time. The name Malta fever has been similarly dealt with, but it is possible that in this disease, at least, we

have gone too far. Malta fever being considered a term too restricted in its meaning, the name Mediterranean was given the disease, and yet again Undulant fever advanced it to a more general platform. Reports from many countries far from Mediterranean shores indicated that the fever in question prevailed there, and cases of Malta fever have been reported from Gibraltar, almost all the islands of the Mediterranean, many parts of Italy, Greece, Turkey, Palestine, from several parts of Africa from Algiers to Zanzibar, from a dozen places in India, from Southern China, Philippines, and Fiji. In the Western Hemisphere also cases are reported from the Mississippi valley, Cuba, Puerto Rico, Venezuela, Brazil, and Monte Video. Staff-Surgeon E. A. Shaw, R.N., has shown that many of these reports are fallacious. The diagnosis has been in the majority of instances made upon clinical phenomena alone; the confirmation either by serum diagnosis or recovery of the *Micrococcus melitensis* during life or after death being altogether wanting.

One would have expected to find cases of Malta fever in the Italian and French Mediterranean littoral, but in not one instance have investigations by Staff-Surgeon Shaw confirmed the presence of Malta fever. The Neapolitan fever had been long suspected to be of the nature of Malta fever, but scientific tests have disproved the assumption. It would therefore seem that the belief that the fever with which the name Malta is associated had a wide geographical distribution is not true. It would even appear that the name Mediterranean is not deserved, for in none of the islands or towns on the seaboard of the adjacent continents has the disease been proved to exist endemically. The name may be an unfortunate one, but in this instance the local name would seem appropriate if not scientific, for there is every evidence to show that Malta fever is, to say the least of it, infrequent and rare elsewhere than in Malta.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the Journal of Tropical Medicine *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Journ. Amer. Medical Association," August 19, 1905.

(1) Status of Medical Affairs in the Philippine Islands. John R. McDill, M.D., Manila.

(2) The Elimination of the Mosquito. A. H. Doty.

(3) Ankylostomiasis or Uncinariasis. T. M. Russell Leonard, L.R.C.P., L.R.C.S.(Edin.), Grenada.

Leonard states that the chief difference between the *Ankylostoma duodenale* (the Old World variety) and *Ankylostoma* or *Uncinaria americana* (the New World variety), so named by Stiles, consists in the size and armature of the mouth. The *A. duodenale* is larger and possesses two pairs of hook-like ventral teeth and one pair of dorsal; the *A. americana* is smaller and possesses two pairs of ventral plates or lips, and one dorsal pair. In Grenada the large majority of cases show the Old World parasite. The disease occurs more frequently in country villages than in the large towns, owing chiefly, no doubt, to the fact that fæces are there deposited on the earth among the bananas and cocoa trees.

In every case of ankylostomiasis amongst natives notified by Leonard pigmentation of the tongue was observed.

He is inclined to attribute the black on the tongue to (1) blood changes in which the hæmoglobin is disintegrated; and (2) disturbance of the nervous system by the toxin produced by the parasite.

Treatment.—A saline aperient at 10 p.m. on the night prior to administration of the thymol is given. The following morning a pint of milk is given and two hours afterwards the thymol.

The drug is exhibited in cachets, 5 grains for a child and 40 grains for an adult, and one cachet is taken every hour till 15 grains are given to the child and 120 grains to the adult. No food is allowed for four hours after the last cachet, when a saline aperient is again taken. The aperient used is sodii sulph. and mag. sulph., āā ʒiss., aqua ad ʒii. for a dose. Beyond some slight dizziness and a sensation of fainting, the administration of thymol has caused no untoward symptoms in Leonard's practice.

The prophylaxis resolves itself into (1) prevention of water infection; (2) prevention of soil infection; (3) treatment of all cases of disease.

(4) A Case of Ainhum. F. Wheatland, M.D.

Wheatland reports a case of ainhum in a negro woman, aged 53, born in Queen Anne County, Maryland. Her father, partly Indian, had lost two toes when about 23 years of age; the cause unstated. The patient had lost the little toe of the left foot after about four years from the first appearance of the constriction at the root of the toe; the right little toe presented, at the time of the report, a deep sulcus round its root. A case of ainhum was reported by Dr. Brayton in the *Journ. Med. Assoc.* of July 8th, 1905.

"Journ. Amer. Medical Association," August 5, 1905.

PFEIFFER'S GLANDULAR FEVER—DRUESENFIEBER.

Glandular fever (Pfeiffer) is ushered in with rigors, headache, pain in the throat and increase of temperature. Soon after the initial symptoms the cervical glands, more especially those around the sterno-mastoid muscle, are enlarged. During the course of the disease acute hæmorrhagic nephritis occurs, and the spleen and liver enlarge. The glands remain discreetly enlarged, rather hard and not very tender. There is eruption on the skin or mucous membrane of the mouth. After three to five days the throat symptoms and feverishness disappear, but the swelling of the glands remains, usually for a week. A death from the disease has not been recorded.

The treatment recommended is: Unguentum Credé (collargol 15, adeps benzoata 75, cera alba 10) applied to neck glands, and the usual treatment for nephritis.

Notes and News.

MEDICAL COLLEGES IN THE UNITED STATES OF AMERICA.—According to the returns for 1904-5, there are 162 medical colleges in the United States, with 26,147 students.

ANISEED AS A GALACTAGOGUE.—Burzagli (*Gazz. degli Osped.*) recommends 25 per cent. infusion of aniseed as a galactagogue. A litre of the infusion is to be drunk during the twenty-four hours, and the breasts fomented with the infusion continuously for some days. It may be noted in this connection that systematic fomentation of the breasts is a good means of promoting the flow of milk even without the addition of aniseed; whilst also copious draughts of plain water or milk are useful adjuncts. It may be the aniseed plays but a small part in producing the flow, but suggestion helps in this physiological act as in others.

JAPANESE MEDICAL MEN AND BRITISH REGISTRATION.—A communication has been received by His Majesty's Government requesting on behalf of the Japanese Government "that steps may be taken so that Japan may be recognised as one of the countries to which the Medical Act of 1886 applies, thus enabling Japanese medical practitioners to practise medicine in the Straits Settlements as well as in other parts of the British Empire."

WELFARE WORK.—The endeavours of Messrs. Burroughs Wellcome and Co. to promote the moral, mental and physical betterment of their people have received recognition at the Liége International Exhibition, just closed. A special gold medal was conferred upon them for the "intellectual and moral development of workers."

SHEFFIELD UNIVERSITY is the latest addition to the growing list of English universities.

Reviews.

A PRACTICAL GUIDE TO COOKERY IN WEST AFRICA AND THE TROPICS. By Sister COCKBURN, late Colonial Nursing Service, Sierra Leone, West Africa. London: The Scientific Press, Ltd., 28 and 29, Southampton Street, Strand. Pp. 160, price 3s. net.

The Scientific Press has published several excellent books on hygienic lines, and the present volume will prove one of the most useful. Sister Cockburn has not only given recipes for invalid cooking, but describes how food may be prepared for healthy folk. There can be no doubt that lack of ability to obtain dainty food is a great drawback to life in the Tropics. The materials are limited to an extent impossible for people in Britain to comprehend; beef and mutton, if available at all, have neither the tenderness nor the nutritive value of home-grown meat, and unless carefully prepared become repugnant to the palate and impossible to digest. Fish in the Tropics has not the flavour of fish from British waters, and there are but few edible varieties.

These drawbacks Sister Cockburn tells us how to overcome, and her culinary suggestions are invaluable. Fowls although plentiful, are apt, from the frequency with which they appear on the table in all tropical countries, to pall upon the appetite, but the fowl sauté, pilan, pooloot, Ashanti fowl, and Spach-cock dishes described go a long way to relieve the monotony of this staple article of diet. Bananas are plentiful, of course, in West Africa, but the banana cream, fritters, and trifle which Sister Cockburn tells us how to prepare are welcome additions to the table. Such attractive names for dishes as Accra wafers, African snowballs, Bonny soup, Cape fillets, Cape goose, Gambia soup, Kohl rabi, Lagos pudding, Mango fool, Teneriffe pudding, Sherbro soup, and others, afford a plethora of change which must be appreciated highly by those who have to put up with native cooks and their cookery. The fruits and recipes given in the book are useful for any household, but for tropical residents they must prove especially serviceable; and if followed will not only reduce the monotony of the meals which is apt to prevail to an inordinate extent in warm countries, but will prove a potent factor in preserving health and preventing disease.

A MANUAL OF CLINICAL CHEMISTRY, MICROSCOPY AND BACTERIOLOGY. By M. KLOPSTVOCK and A. KOWARSKY, of Berlin. Translated by THEW WRIGHT, M.D. Rebman Ltd., 139, Shaftesbury Avenue, London, 1905. Pp. 296, price 8s. net.

This book, which has been popular in Germany for some time, should prove useful to all English-speaking medical men. It is concise, practical, and thoroughly up to date. For medical men in the Tropics we know of no work of the kind which so completely meets their special wants.

A PLEA FOR THE MORE ENERGETIC TREATMENT OF THE INSANE. By CHARLES WILLIAMS, L.R.C.P., L.R.C.S. H. J. Glaisher, 57, Wigmore Street, Cavendish Square, London, 1905. Pp. 51, 1s. 6d. net.

This book will serve to stimulate medical men to consider whether the lethargy which has so long obtained, in regard to the treatment of the insane, might not with advantage be laid aside.

NEW BOOKS ON GENERAL LITERATURE RELATING TO THE COLONIES AND INDIA.

The Empire and the Century. A series of Essays on Imperial Problems and Possibilities. By various writers. 8vo, pp. xxiii.-895. London: John Murray, 1905. (Price 21s.)

Stow, George W., F.G.S., F.R.G.S.—The Native Races of South Africa. A history of the intrusion of the Hottentots and Bantu into the hunting grounds of the Bushmen, the aborigines of the country. Edited by George McCall Theal, Litt.D., LL.D. 8vo. London: Swan, Sonnenschein and Co., Ltd., 1905. (Price 21s.)

Mingard, W. Yere.—Round the World: Our Colonial Cousins, or Britain Beyond the Seas. 12mo, pp. 288. London: T. C. and E. C. Jack, 1905. (Price 1s. 6d.)

Hooker, Sir Joseph Dalton (K.C.S.I., C.B., M.D., D.C.L., F.R.S.).—Himalayan Journals, or Notes of a Naturalist in Bengal, the Sikkim, and Nepal Himalayas, the Khasa Mountains, &c. 8vo, pp. xxxi.-574. London: Ward Lock and Co., 1905. (Price 6s)

Lyne, Robert Nunez (F.L.S., F.R.G.S.).—Zanzibar in Contemporary Times: a Short History of the Southern East in the Nineteenth Century. 8vo, pp. xii.-328. London: Hurst and Blackett, 1905. (Price 10s. 6d.)

Hopkins, J. Castell (F.S.S.).—The Canadian Annual Review of Public Affairs, 1904. 8vo, pp. xxi.-630. Toronto: Annual Review Publishing Co. (Price 12s. 6d.)

Bell, W. H. Somerset, and Nathan, Manfred (LL.D.).—The Legal Handbook of Practical Laws and Procedure, together with Tariffs of Fees of Office and Stamps in British South Africa, together with a Law List, 1905. 8vo, pp. xiv-891. Grahamstown: African Book Co. (Price 25s.)

Broomhead, J. W.—Round the Rand. Sm. 4to, pp. 100. London: *Financial Times* Office, 1905. (Price 2s. 6d.)

King, W. J. Harding (M.R.A.S., F.R.G.S.).—A Search for the Masked Tawareks. 8vo, pp. viii.-334. London: Smith, Elder and Co, 1903. (Price 6s.)

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New Instruments, &c.

TWO NEW MICROSCOPE OBJECT GLASSES.—R. and J. Beck, Ltd., 68, Cornhill, London, E.C., have just brought to our notice two useful lenses.

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COLONIAL CIVIL SERVICE.

MR. HENRY B. WALCOTT, Treasurer and Collector of Customs of British Honduras, is acting as Colonial Secretary of that Colony in place of the Hon. H. E. W. Grant, who has left Belize on promotion to the Colonial Secretaryship of the Falkland Islands. Mr. Walcott will continue to perform the duties of his substantive office in addition to those of Colonial Secretary.

Mr. L. W. Booth has been appointed District Judge, Commissioner of Requests, and Police Magistrate at Batticaloa, Ceylon. He has been in the Ceylon Civil Service for twenty-seven years, and has served in all parts of the Colony. Prior to proceeding on leave last year he was the Government Agent for the North Central Province.

Mr. Laurence Macrae is to succeed Mr. Neil F. Mackay as Private Secretary to the Premier of British Columbia and Assistant to the Statistician of that Province of the Dominion.

Lieutenant A. J. R. Dewar, of the Malay States Guides, has been selected for the office of an Assistant Superintendent of Police under the Government of the Straits Settlements.

Dr. A. R. Wellington has proceeded to Sarawak as an Assistant Medical Officer. He was formerly Assis-

tant Medical Officer of the Kensington Infirmary, which office he recently resigned.

Mr. Eric Maxwell becomes a member of the Council of the State of Perak, Federated Malay States, during the absence on leave of Mr. Francis D. Osborne for twelve months.

Mr. Stanley Fisher, President of the District Court, Kyrenia, Cyprus, is coming to England on leave of absence, during which his duties will be performed by Mr. J. C. Macaskie, President of the Famagusta District Court.

Mr. W. E. U. Grove has resumed the duties of Superintendent of Police, Malacca, Straits Settlements, and is also acting as Harbour Master and Conservator of the Port of Malacca in addition to his other duties.

Mr. R. M. Little, Resident of Kudat, British North Borneo, will leave England early in January to resume duty after leave of absence.

Mr. W. L. Kindersley, late Assistant Government Agent, Trincomalee, Ceylon, has taken over the duties of Assistant at Chilaw to the Government Agent of the North-West Province.

Mr. F. G. Stevens, who was formerly connected with the Straits Civil Service, which he entered as a cadet in the year 1902, has been made a magistrate of the first class for the District of Raub, Federated Malay States.

Mr. H. A. Adams is acting as Superintendent of the Public Works Department, Sarawak.

Sir Alfred Sharpe, K.C.M.G., C.B., Commissioner of the British Central Africa Protectorate, leaves Marseilles on the 23rd instant on his return to duty.

The Governorship of British Honduras will probably become vacant at an early date, as Sir Bickham Sweet-Escott, K.C.M.G., who has been granted an extension of leave until the end of February, is not expected to return to the Colony.

Mr. P. J. Sproule is acting as Deputy Public Prosecutor, Singapore, in consequence of the transfer of Mr. W. L. Woodward to one of the newly created judgeships in the Federated Malay States.

His Excellency E. P. Gueritz, who recently resigned the appointment of Governor of British North Borneo, has withdrawn his resignation, and is administering the Government.

A proposal is to be submitted to the Ceylon Legislative Council, with the approval and consent of the Secretary of State, for the increase of the salaries of all classes of the Civil Service of Ceylon, at a total cost to the Colony of Rs. 500,000 per annum. The subject has engaged the attention of the Secretary of State and the Governor of the Colony for the past two years, and it is expected that the scheme will partly come into force on January 1st.

Dr. J. W. Farndale has been appointed District Surgeon of Mwomboshi, North-east Rhodesia, by the British South Africa Company. He sails before Christmas.

HOMBURG Salt, prepared from the water of the well-known Homburg Elizabeth Spring, is sent by Rüdiger and Co. (Homburg v. d. Hohe), in bottles for trial purposes. These are always at the disposal of the medical profession, and will be sent free of all charges.

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The proprietors have, indeed, already received satisfactory testimonials from medical men in the Tropics as to its efficacy in infantile diarrhœa and dysentery. In military campaigns also, and in the navy, this product will prove a boon, being pure, palatable and very portable. The "Defiance" brand of dried milk was put to a practical test recently in this connection, being the only milk supplied to the sailors and soldiers engaged in the Royal Naval and Military Tournament at the Agricultural Hall this year, and the P.M.O. in charge reported on it as "a valuable substitute for ordinary milk, handy, and hard to distinguish from boiled milk."

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5.—Correspondents should look for replies under the heading "Answers to Correspondents."

SELECTIONS

FROM

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No. 1.

BASUTOLAND.

Medical Report for the Year ending December 31st, 1903.

By EDWARD CHARLES LONG, M.R.C.S., L.R.C.P.

Principal Medical Officer.

Population.

No estimate of population which would be of any value is possible at present. The coming census should however provide some interesting information for next year's report. In 1899 the population was estimated at 270,000, including 700 Europeans.

General Health of the District.

The year under review may be said to have been an average healthy one. There have been but few epidemics, and none of importance, with the exception of *Scurvy* and *Pneumonia*, to which reference will be made later.

Whooping Cough

Was prevalent during the winter, and rather more cases of bronchial affections were noticed, but they were mostly of a mild nature.

Enteric Fever.

There were fewer cases of *Enteric Fever* than usual. Some districts were practically free of this complaint throughout the year.

Intestinal Disorders.

There was the usual amount of *Infantile Diarrhœa* in the summer months, mostly traceable to improper feeding.

Most of the cases of *Dysentery* which were admitted to the hospital occurred in labourers returning from work in neighbouring territories.

Leprosy.

The increase in the number of lepers recorded is due to the investigation which was undertaken during the year, and concerning which a full report has been made to the Colonial Office.

Syphilis.

Except in the *Tertiary forms*, *Syphilis* shows a slight decrease for the first time, a most satisfactory feature, as the disease is one of the greatest scourges in the country. The natives seem to appreciate more aud more the value of treatment in this disease, and the knowledge that it can be cured has spread to the remoter districts. People frequently come or send many days' journey to ask for medicine. I have in previous reports referred to the appalling tertiary cases which are so common. The people have lately coined a word "moto" to designate one of the commonest lesions, viz., phagedænic ulceration of the fauces and palate, which they look upon as a distinct disease, and they have likened its ravages to that of moth in blankets, "moto" being a corruption of the Dutch word "mot."

New Growths.

There has been an increased number of *Benign Growths* treated, and since the date of the circular issued by the Cancer Research Committee a considerable number of specimens has been despatched to the Director of the Committee.

The few cases of *Malignant Disease* noted were not of much value scientifically, owing to the rooted aversion to *post-mortem* examinations exhibited by friends of deceased patients. Consequently scarcely any specimens of this kind are ever available.

Diseases of the Eye.

Ophthalmia of a mild type was as usual noted throughout the year, and was not affected by the seasons.

The considerable increase in the number of *Cataract* cases treated is due to the fact that the people are gradually learning that the disease is capable of relief. Forty cases were successfully operated on; they were all of the senile variety.

The prevalence of *Glaucoma* is noteworthy. Unfortunately the bulk of the cases only come when the glaucoma is absolute and beyond relief.

A good many *Cases of Blindness*, due to the destruction of the cornea from small-pox, have been seen. These patients have often heard of friends who have been successfully operated on for cataract, and it is most distressing to have to send them away unrelieved.

In some cases in which the cornea is not hopelessly destroyed Darier's method of subconjunctival injections is now being tried at Maseru Hospital, and Dr. Jones hopes in my next report to be able to embody the results of the trial.

Generative Organs.

An increasing number of *Diseases of the Female Generative Organs* is noted. Subinvolution from improper care after parturition is the most common.

One case of malformation deserves notice on account

of its rarity, viz., *Congenital Absence of the Vagina.* patient was a girl of about sixteen years of age, and attention was first called to her condition by the absence of menstruation. The external genitals were small, but otherwise normal. The vagina was entirely absent, and represented by a fibrous cord. The uterus and ovaries were present, but infantile in type. An exploratory operation was performed, but the case was found to be beyond the scope of surgical interference. In connection with this case I may state that about two years ago I operated successfully on a case of partially occluded vagina in a young native woman.

Digestive System.

Functional Disorders of the Digestive System were, as usual, very numerous, and are mainly due to injudicious diet.

Meteorology.

The meteorological conditions in 1903 were very unfavourable to the public health. There was a failure of the late summer and autumn rains, with very early frosts, which destroyed most of the scanty crops which had survived the dry weather. The winter was cold and dry, and extraordinarily windy and dusty. There was a prolonged drought in the spring which destroyed the wheat crop, and deprived the people of the food they are accustomed to depend on till the mealies ripen, besides preventing the growth of the wild spinach and other herbaceous plants which are used as an article of diet in the spring and early summer months. The drought persisted through the first two summer months, although some rain fell in November and December. Windy weather with dust may be said to have prevailed during six months of the year.

The total rainfall for the year was 12 inches below the average. The effect of such inclement weather on the health of the people was twofold. Firstly, it entailed a general scarcity of the staple food of the country, with a consequent general lowering of vitality. The scarcity had to be made up by the importation of grain, which in the main was of very inferior quality, and in some cases positively harmful. The absence of the usual supply of fresh grain (wheat) and green vegetable food in the late spring and early summer months accentuated this. Hence the prevalence of scurvy and digestive troubles. Secondly, the cold, windy, and dusty weather of the winter and spring months was indirectly responsible for the prevalence of pneumonia and bronchial troubles.

Epidemic of Pneumonia.

The number of cases of pneumonia recorded does not afford a correct estimate of the extent of the epidemic. From information supplied to Dr. Long, he judges there was a considerable number of deaths from this complaint in July and August, the months when the disease was most prevalent in other parts of South Africa. Certainly the type of disease in the cases which came under his immediate notice was much more severe than have been accustomed to be observed here in former years, and the death rate was proportionately high.

Prevalence of Scurvy.

Mild cases of this disease have from time to time been observed in Basutoland, but during 1903 a considerable percentage of the people have suffered, and there have been many deaths. A large number of the cases occurred in labourers returning from work in neighbouring territories. Many of these arrived in Basutoland in a pitiable condition. So common has scurvy been during 1903 that the Basuto have coined a word to describe it. They call it "mochecha fatsi," which means to propel oneself on the haunches by the aid of the hands, this being the only way in which advanced cases with painful brawny swellings of the calves are able to move about.

During the month of December, when the epidemic was at its worst, Dr. Long examined a large number of out-patients for signs of scurvy, and discovered indications of the disease in a considerable percentage of those who sought relief for other diseases. An examination of a batch of labourers destined for the Koffyfontein mine led to the rejection of 25 per cent. on account of incipient scurvy.

So far as observed here, the symptoms of scurvy do not differ from the classical symptoms described in text-books. Swollen, spongy gums, which bleed readily, offensive breath with dry, harsh skin and great weakness and prostration, are early symptoms. Great pain in the lower extremities is complained of, and in advanced cases there were always brawny, painful swellings of the calf muscles. Subcutaneous hæmorrhages were rarely observed. Adults, especially males, seemed most liable to the disease. Few cases were observed in children. The mortality was highest in young male adults, especially those who had been working on the railways and mines.

The cause of the epidemic has already been referred to. Certainly in Basutoland Dr. Long considers the bad quatity of the imported grain to be largely responsible.

The treatment of cases was beset with difficulties, owing to the impossibility of obtaining anti-scorbutic articles of diet. Lime-juice we found nearly useless when the disease was well established. It was valuable, however, as a prophylactic in the gaols, which were, with the exception of two cases, quite free of the disease.

The most rapid cure was obtained by the addition of oranges to the diet. Unfortunately the available supply only permitted of this remedy being used in a few cases. As regards drugs, citric acid, with large doses of cinchona, seem to afford most relief.

Sanitary Conditions.

The sanitary condition of the territory calls for no comment. The water supply at most stations is still insufficient. At Mafeteng and Leribe the deficiency was most acutely felt, and was much intensified by the phenomenally dry year. Schemes for obviating this in future have, I understand, been already drawn up and authorised.

Vaccinations.

Sixty thousand five hundred and fifty-five Vaccinations were performed during the year, all with calf lymph supplied by the Cape Bacteriological Institute.

The following return of cases treated at the Hospitals is attached to this report:—

RETURN OF DISEASES AND DEATHS IN 1903 AT THE BASUTOLAND HOSPITALS.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	—	—	—
Anæmia	—	—	39
Beri-beri	—	—	—
Bilharziasis	—	—	—
Black-water Fever	—	—	—
Chicken-pox	—	—	—
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Debility	4	—	240
Delirium Tremens	—	—	—
Dengue	—	—	—
Diabetes Mellitus	—	—	3
Diabetes Insipidus	—	—	—
Diphtheria	—	—	1
Dysentery	7	3	28
Enteric Fever	4	—	22
Erysipelas	—	—	5
Febricula	2	—	144
Filariasis	—	—	—
Gonorrhœa	—	—	326
Gout	—	—	24
Hydrophobia	—	—	—
Influenza	—	—	101
Kala-Azar	—	—	—
Leprosy—			
(*a*) Nodular	—	—	2
(*b*) Anæsthetic	—	—	3
(*c*) Mixed	—	—	17
Malarial Fever—			
(*a*) Intermittent	—	—	—
Quotidian	—	—	—
Tertian	—	—	—
Quartan	—	—	—
Irregular	—	—	—
Type undiagnosed	—	—	—
(*b*) Remittent	—	—	—
(*c*) Pernicious	—	—	—
(*d*) Malarial Cachexia	—	—	—
Malta Fever	—	—	—
Measles	—	—	2
Mumps	—	—	175
New Growths—			
Non-malignant	—	—	199
Malignant	—	—	9
Old Age	—	—	—
Other Diseases	—	—	—
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	—	—	2
Rachites	—	—	6
Rheumatic Fever	—	—	17
Rheumatism	2	—	767
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	16	—	222
Septicæmia	—	—	—
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox	—	—	—
Syphilis—			
(*a*) Primary	—	—	15
(*b*) Secondary	—	—	234
(*c*) Tertiary	12	2	1067
(*d*) Congenital	—	—	366
Tetanus	—	—	—
Trypanosoma Fever	—	—	—
Tubercle—	—	—	—
(*a*) Phthisis Pulmonalis	5	—	59
(*b*) Tuberculosis of Glands	12	—	57
(*c*) Lupus	—	—	3
(*d*) Tabes Mesenterica	1	—	5
(*e*) Tuberculous Disease of Bones	—	—	3
Other Tubercular Diseases	—	—	—

	Admissions.	Deaths.	Total Cases Treated.
GENERAL DISEASES—*continued.*			
Varicella	—	—	18
Whooping Cough	—	—	579
Yaws	—	—	—
Yellow Fever	—	—	—

LOCAL DISEASES.

Diseases of the—			
Cellular Tissue	40	1	300
Circulatory System	3	1	72
(*a*) Valvular Disease of Heart	—	—	—
(*b*) Other Diseases	—	—	44
Digestive System—	—	—	4304
(*a*) Diarrhœa	—	—	885
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	—	—	1
Congestion of Liver	—	—	—
(*d*) Abscess of Liver	—	—	—
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	—	—	7
(*g*) Cirrhosis of Liver	—	—	—
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	—	—	—
Ear	—	—	264
Eye	72	—	722
Generative System—			
Male Organs	27	—	113
Female Organs	21	—	531
Lymphatic System	—	—	141
Nervous System	10	—	320
Nose	—	—	77
Organs of Locomotion	11	—	90
Respiratory System	18	6	2285
Skin—	—	—	—
(*a*) Scabies	—	—	39
(*b*) Ringworm	—	—	55
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	5
(*e*) Eczema	1	—	403
(*f*) Other Diseases	1	—	442
Urinary System	—	—	88
Injuries, General, Local—			
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	31	—	360
Parasites—			
Ascaris lumbricoides	—	—	—
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	—	—	—
Tape-worm	—	—	142
Poisons—			
Snake-bites	—	—	1
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	1
Nature Unknown	—	—	—
Other Poisons	—	—	—
Surgical Operations—			
Amputations, Major	—	—	132
,, Minor	—	—	863
Other Operations	—	—	—
Eye	—	—	—
(*a*) Cataract	—	—	80
(*b*) Iridectomy	—	—	20
(*c*) Other Eye Operations	—	—	—

No. 2.

ST. KITTS-NEVIS AND ANGUILLA.

Medical Report on the Sanitary Condition of the Presidency of St. Kitts-Nevis and the Island of Anguilla, with Statistical Tables for the Year ending December 31st., 1903,

By W. H. FRETZ, L.R.C.P., L.R.C.S.Edin.

Population.

The population during the year 1903 was for St. Kitts, 30,314; Nevis, 13,422; Anguilla, 4,073; and that the death-rate was for St. Kitts, 30·77 per mille, against 26·17 per mille in the previous year; Nevis, 23·61 per mille against 21·87 per mille in the previous year; Anguilla, 23·07 per mille, against 18·88 per mille in the previous year; while the birth-rate was for St. Kitts, 36·55 per mille, against 35·70 in the previous year; Nevis, 40·38 per mille, against 44·93 in the previous year; Anguilla, 40·90 per mille, against 28·43 in the previous year.

Birth-rate.

The birth-rate is interesting, as will be seen from the following tabular statement:—

—	Legitimate Births	Legitimate Birth-rate per 1,000	Illegitimate Births	Illegitimate Birth-rate per 1,000
St. Kitts ..	378	12·40	711	23·40
Nevis ..	228	17	312	23·30
Anguilla ..	105	26·20	91	22·70

The Public Health

Of the inhabitants was good. There was an absence of any widespread outbreak of any serious epidemic disease.

Malaria.

Malarial Fever has hitherto not been endemic in this Presidency, but owing to the frequent emigration and immigration now going on to and from islands where cases always occur, the tendency to endemicity is beginning to prevail, and at certain seasons of the year may even prove to be epidemic. The most common type of fever in this island is the remittent, and is found among all classes.

Chicken-pox.

This mild infectious disease has been reported from several parts of the Presidency, though it never became epidemic.

Intestinal Disorders.

Dysentery seems to have been fairly distributed throughout the Presidency.

Diarrhœa prevailed generally, and though not in an epidemic form, contributed largely to the death-rate, chiefly of infants.

Leprosy.

The total number of cases in the Lazaretto on December 21st, 1903, was sixty-two, against seventy-one in the previous year; two new cases were received, against eight in the previous year. The question as to the necessity of the segregation of lepers has recently been contested, but if it be conceded that leprosy is caused by a germ, then the leper must be regarded as a source of danger, and the most effectual way of suppressing the disease seems to be by the thorough isolation of existing lepers; wherever the disease has been treated by such it has slowly but surely died, but where it has not, the disease has continued and still prevails. It is impossible to state if this disease is on the increase in this island; the compulsory notification of leprosy may prove useful in this connection. The benefits gained by the Presidency by having in its midst such an institution as the Lazaretto have been abundantly proved, providing, as it does, for those who have no homes and no means of protecting themselves.

Yaws.

From the reports of the District Medical Officers, this disease seems to be on the increase in the Presidency. As sanitary methods become more generally known through recent legislative measures, we trust it may show a marked decrease. A valuable paper on this subject by Dr. Rat, of Anguilla, is appended.

Tuberculosis.

A diseased condition of a specific and infective nature, which occurs in different forms, is very prevalent among our coloured population, who seem very susceptible to its ravages; 158 deaths are attributed to tubercle during the year under review.

Cancer.

Eighteen deaths are placed under this heading. Our native population are not very prone to this dreadful malady.

Sanitary Condition.

The general sanitary condition of the Presidency remains in much the same condition as last year; the same method of disposal of fæcal matter exists, but the subject has been considered by the Town Board of Basseterre, and a more sanitary method to take the place of the present one is under consideration. The town of Basseterre seems to be extending, and urgent methods should be taken to keep it in as sanitary a condition as possible.

Port sanitation is a chief consideration, and a first line of defence to the town against disease is the sanitation of the port.

The dust is objectionable and detrimental to health, and the streets should, if possible, be watered more frequently to allay this nuisance. The scavenging is good. The water supply is of good quality, but during a long drought is a source of some anxiety.

The houses of the poor need much improvement, and attempts should, if possible, be made to make these more healthy and sanitary.

The Medical Officer of District 5 (Dr. Foreman) reports as follows: "In my district the first three-quarters of the year were pretty healthy, but the last one was very unhealthy, diseases of the digestive and respiratory organs being prevalent. I am sorry to say that yaws is on the increase in this part of the island."

The Medical Officer of District 6 (Dr. Bell) reports as follows: "The health of District 6 was not satisfactory during last year. Malarial fevers, chiefly of the remittent form, prevailed in the early and late months, and diarrhœa and dysentery in children and adults during the warm season."

The Medical Officer of District 7 (Dr. Cooke) reports as follows:—

"(1) The past year has not been remarkable in this district for the occurrence of serious epidemic disease, nor was it possible to note any particular seasonal prevalence, with perhaps the exception of the usual increase of intestinal disorders in children during the hot months.

"(2) There were a few cases of varicella about the middle of the year, but the disease did not become epidemic; and the sporadic cases, which included adults as well as children, did not present much constitutional disturbance, nor require much in the way of treatment.

"(3) The education of the people in sanitary matters makes very slow progress, and the results of dirt and poverty are very manifest, even to a casual observer. In this connection, I may mention, there has been a great prevalence of tinea taral amongst the children of the district. Yaws also is widely spread throughout the island, and seems to be on the increase.

"In attempting to combat these diseases the greatest difficulty is experienced in getting the people to continue treatment, in conjunction with cleanliness, long enough to be effectual.

"(4) As the number of emergencies this year has been few, the majority of the cases treated at the Nevis Emergency Ward have been badly ulcerated legs in young adults, a class of case of very frequent occurrence in the district, and mainly the result of neglected yaws, or poverty and yaws combined, so that the beds have been occupied one way or another throughout the year."

Health of Anguilla.

The Medical Officer of Anguilla (Dr. Rat) reports as follows: "There is nothing special to report with regard to the health of Anguilla during the first two quarters of the past year.

"The third and fourth quarters were marked by a very high mortality, which was indirectly caused by the want of food from which the poorer classes suffered as the result of a long-continued drought.

"Malarial fever prevailed very extensively during the last quarter and still continues, chiefly in the eastern portion of the island, where the excavations caused in the limestone rocks by the rain form reservoirs where the mosquitos breed freely and undisturbedly. The fever did not present any of the several symptoms which characterised the previous epidemic. It showed rather a tendency to pass into the form of the pure intermittent after a few days of continued pyrexia, and to become chronic."

Vaccinations.

During the year there were 1,657 cases of successful vaccinations, against 1,776 cases for the previous year. The children of this Presidency are well protected against small-pox, but the same cannot be said of its adult population. The Government in their wisdom have offered them re-vaccination, but they are not willing to avail themselves of the boon. Considering that small-pox in its natural state is one of the most loathsome, disfiguring, and fatal diseases, the only protection of any avail being vaccination, it will be a wise provision that re-vaccination be made compulsory by law, and that it be performed during the ages of 10 and 13 years.

Health Ordinances.

Two legislative enactments which came into force during the year are of medical interest, and must prove beneficial to the Presidency—No. 12 of 1902, and No. 13 of 1902. The former, the *Health Ordinance,* establishing local boards of health in the several country districts, and giving representative local residents control of their sanitary measures, must serve a useful purpose; the latter, the *Infectious Diseases Ordinance,* provides for the notification of infectious and notifiable dieeases, and the proper control of such. The coming into being of the Basseterre Town Board marks a new era in the management of the sanitary measures of the chief town, and much may be expected from it in progressive sanitation. The question of quarantine has been brought forcibly to notice of late; the want of uniformity in its rules and regulations has been apparent; the necessity for careful consideration of the whole subject under the light of modern views and theories has been abundantly proved. As the question is shortly to be discussed at a conference, it will prove no useful purpose to enter into the subject at this stage.

Medical Staff.

The Medical Staff of the Presidency is now complete with seven District Medical Officers, and Medical Superintendent of the Cunningham Hospital. In this connection I cannot conclude this report without reference to the retirement of Dr. W. J. Branch from the public service of the Presidency. Entering as a District Medical Officer in the year 1863, he devoted forty years of his life to assiduous and earnest medical work, gaining for himself universal respect. To the Cunningham Hospital he has devoted the best energies of his life; this institution owes more to him than any other man. To his junior colleagues and consultants he gave utter loyalty, with a strong professional instinct. He is still amongst us, ever ready to give of his fund of varied experience and knowledge, though retired from active duties.

RETURN OF DISEASES AND DEATHS IN 1903 AT ST. KITTS-NEVIS AND THE ISLAND OF ANGUILLA.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	6	—	6
Anæmia	5	1	7
Beri-beri	—	—	—
Bilharziasis	—	—	—
Black-water Fever	—	—	—
Chicken-pox	—	—	—
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Debility	25	7	39
Delirium Tremens	—	—	—
Dengue	—	—	—
Diabetes Mellitus	—	—	—
Diabetes Insipidus	—	—	—
Diphtheria	—	—	—
Dysentery	32	6	32
Enteric Fever	—	—	—
Erysipelas	3	1	3
Febricula	4	—	4
Filariasis	21	2	27
Gonorrhœa	23	—	24
Gout	—	—	—
Hydrophobia	—	—	—
Influenza	4	2	5
Kala-Azar	—	—	—
Leprosy—			
(*a*) Nodular	1	3	21
(*b*) Anæsthetic	1	8	52
(*c*) Mixed	—	—	—
Malarial Fever—			
(*a*) Intermittent	1	—	3
Quotidian	9	—	9
Tertian	—	—	—
Quartan	—	—	—
Irregular	—	—	—
Type undiagnosed	—	—	—
(*b*) Remittent	59	5	61
(*c*) Pernicious	—	—	—
(*d*) Malarial Cachexia	—	—	—
Malta Fever	—	—	—
Measles	—	—	—
Mumps	—	—	—
New Growths:			
Non-maliginant	13	—	14
Malignant	11	3	19
Old Age	—	—	—
Other Diseases	—	—	—
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	1	1	1
Rachitis	—	—	—
Rheumatic Fever	—	—	—
Rheumatism	—	14	17
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	—	—	—
Septicæmia	—	—	—
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox	—	—	—
Syphilis—			
(*a*) Primary	21	—	22
(*b*) Secondary	124	8	136
(*c*) Tertiary	—	—	—
(*d*) Congenital	3	—	4
Tetanus	2	1	3
Trypanosoma Fever	—	—	—
Tubercle—			
(*a*) Phthisis Pulmonalis	—	—	—
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tubercular Diseases of Bones	—	—	—
Other Tubercular Diseases	55	29	65
Varicella	—	—	—
Whooping Cough	—	—	—
Yaws	9	—	10
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	54	—	57
Circulatory System—			
(*a*) Valvular Disease of Heart	16	4	17
(*b*) Other Diseases	9	3	9
Digestive System—			
(*a*) Diarrhœa	24	3	26
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	—	—	—
Congestion of Liver	—	—	—
(*d*) Abscess of Liver	—	—	—
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	—	—	—
(*g*) Cirrhosis of Liver	—	—	—
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	168	4	179
Ear	3	—	3
Eye	56	—	60
Generative System—			
Male Organs	33	—	33
Female Organs	62	2	67
Lymphatic System	—	—	—
Nervous System	86	17	114
Nose	—	—	—
Organs of Locomotion	19	2	28
Respiratory System	23	4	26
Skin—			
(*a*) Scabies	—	—	—
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	—	—	—
(*f*) Other Diseases	126	12	159
Urinary System	47	14	52
Injuries, General, Local—			
(*a*) Siriasis (Heat-stroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	78	4	86
Parasites—			
Ascaris lumbricoides	1	—	1
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or ankylostoma duodenale	8	1	8
Dracunculus medinensis (Guinea-worm)	—	—	—
Tape-worm	—	—	—
Poisons—			
Snake-bites	—	—	—
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature unknown	—	—	—
Other Poisons	1	—	1
Surgical Operations—			
Amputations, Major	18	—	19
,, Minor	99	—	105
Other Operations	—	—	—
Eye	12	—	12
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

"YAWS," BY DR. J. NUMA RAT.

Its introduction into Anguilla in 1903 (Anguilla is an island which lies sixty miles north-east of St. Kitts, British West Indies).

Yaws had not appeared in Anguilla within the memory of any of its inhabitants until June 1902, when a Negro, aged 8, an Anguillian, returned here from a visit to St. Kitts, with a fungating ulcer on one of her ankles, which proved to be the primary lesion of an attack of frambœsia.

There were at the time seven members (including the parents) of the family to which the girl belonged, the other children being two girls aged 14 and 5, a boy of 12 and an infant a few months old. They lived in a one-roomed thatched, unfloored hut, standing fifty yards away from the nearest dwelling.

In December, 1902, the eldest girl was suffering from a "scratch" on the upper part of her leg, which had suppurated, and she applied to it some of the ointment with which her infected sister was dressing the sore on her ankle. After a few days a fungating ulcer appeared on the site of the "scratch."

In January, 1903, the boy, aged 12, became infected with the disease through a wound on the foot, which shortly after began to fungate.

In June, 1903, the girl, aged 5, was infected through a fissure between two of her toes, which gradually spread into a fungating ulcer.

As there were no cases of yaws in the island when the girl returned here from St. Kitts, the nature of her disease was unsuspected, and the parents continued to treat the sore for several weeks as an ordinary ulcer. Nor do they seem to have attached any importance to the squamæ and papules which appeared on the patient between June and December, 1903.

Nor even when the eldest daughter was infected was the disease recognised.

It was not until January, 1903, when the schoolmaster brought for my inspection the boy of 12, with a frambœsial granuloma on the scrotum, that it was discovered that yaws had been introduced into the island.

The disease followed the usual course in the four cases. There was first the characteristic change in the lesion at the site of infection, and then, after a few weeks, a general eruption consisting of squamæ and papules, of which only a very few developed into granulomata.

The treatment of all the cases consisted of perchloride of mercy in small, and perchloride of iron in moderate doses during six months. By June, 1903, the two elder girls showed no symptoms of the disease. The affection proved more rebellious to treatment in the boy, in whose case, after the disappearance of the general eruption in July, 1903, hard papules developed on the knees and fronts of the legs, and on the elbows and backs of the arms. These disappeared, as usual, very gradually, and even up to the present a few of them are yet to be seen.

The boy was also the only one in whom granulomata appeared on the soles of the feet. These persisted six months after the general eruption had disappeared.

The disease in the case of the youngest girl, aged 5, was of a much milder form, the cutaneous symptoms consisting only of squamæ and papules and a solitary granuloma on the back of the hip. On account presumably of the mildness of her attack, the mercury was not persevered with as in the other cases, and she still exhibits squamæ and papules, but no granulomata.

In addition to the mercury and iron internally, sulphate of copper was applied to the gramulomata on the soles of the boy's feet, and all the patients were washed with water and a soap containing perchloride of mercury. The application of this soap was considered by the mother of the children as very effective in getting rid of obstinate squamæ and papules, and it certainly seemed to be useful, both for that purpose and for preventing the appearance of any further eruption.

I have already pointed out in a previous paper the necessity of determining whether yaws is a purely constitutional disease, or whether, like tuberculosis, it may be either constitutional or local, or both. Different views have been held as to its nosology, and the present one is that it is a constitutional disease. It is, however, possible that its germs may affect the skin without invading the system generally, or, which appears to me probable, that while it may be a general affection resulting from the introduction of the virus through some cutaneous lesion, the microbes may subsequently find their way into the frambœsial eruption, thus aggravating it and producing the granulomata and ulcers which appear at later stages of the disease.

It is possible that the squamæ and papules are the only true secondary symptoms of the systemic infection, and that the granulomata are caused by an effort of the skin to repel the germs attacking it from without.

We have yet to learn also to what extent the system may become infected through the granulomata, and whether it is not through them that the virus is admitted which produces the eruptions supposed by some to be symptoms of a fresh infection, and by others to be further manifestations of the original attack.

Such considerations suggest the need of external applications which will not only destroy the granulomata and cause the disappearance of the squamæ and papules, but will also prevent the invasion of the skin by frambœsial or other microbes.

Germicidal remedies should be freely used with this object, and it is with this intent that I directed the bodies of the patients herein mentioned to be washed twice a day with the sublimate soap.

The floors of yaws hospitals should also be frequently disinfected, as well as the bed-clothes and apparel of their inmates.

Children discharged from a yaws hospital and allowed to return to the dwellings in which they contracted the disease are thus exposed to further infection. In such circumstances the eradication of the affection is an impossibility. If the houses in which they live have wooden or stone floors, these should be disinfected. If not, the upper layer of the earth within the houses and in their immediate neighbourhood should be removed to a sufficient depth and thrown away, after having been disinfected, and should be replaced by fresh uninfected earth. Such a measure would furthermore assist in preventing the infection of other members of the family.

SELECTIONS FROM COLONIAL MEDICAL REPORTS.

No. 3.

CEYLON.

Medical Report on the Health and Sanitary Condition of the Island for the Year ending December 31st, 1903, with the Hospital Returns for the same Period.

By Sir ALLAN PERRY, M.D., D.P.H.

I.—Population: Birth and Death-rates.

The estimated population of the Island on December 31st, 1903, was 3,740,562 (exclusive of the military and shipping population); 148,027 births and 96,084 deaths were registered. The birth-rate was 40·0 per mille against 38·5, and the death-rate 25·9 per mille against 27·5, in the previous year, calculated on the estimated population at the middle of the year.

II.—Public Health.

The public health during the past year has been good. There have been very few outbreaks of epidemic disease, and the numbers attacked for each of the more serious infectious diseases have been less than in 1902 (with the exception of enteric fever), *vide* Table I. :—

Table I.

	Cholera		Small-pox		Malaria		Enteric Fever	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
1902 ..	179	116	146	35	6,513	115	243	63
1903 ..	46	23	29	5	4,766	108	358	71

Enteric Fever.—The increase in the number of enteric fever cases is, I doubt, not a real one; at the same time it must be remembered that the notification of these cases is becoming more general, and the bacteriological aid in diagnosis is more used by medical practitioners. In December an amended regulation for the notification of this disease was promulgated, which should still further increase the numbers notified. The number of cases of this disease treated in the several hospitals was 358, with 71 deaths, a death-rate of 19·83 per cent. The General Hospital, Colombo, returned the largest number of cases, viz., 212, with 36 deaths, a death-rate percentage of 16·98. Some of these cases were admitted to the hospital from ships. In the jails there were 26 cases of enteric fever, with 4 deaths, a death-rate of 15·38 per cent. The cause of the increase may be put down to contaminated water, for as long as cesspits and wells in close proximity to them exist, cases will increase in numbers.

Cholera.—It is satisfactory to note the small number of cases of cholera. This comparative freedom may be attributed to the closure of the North road coolie route, and to the quarantining of coolies at Ragama. The total number of cases was 46, with 23 deaths. The cases occurred in the Western, Central, and North-Central Provinces. The infection in nearly every instance could be traced to India.

The subjoined table shows the Provinces in which outbreaks occurred, the number attacked, the number of those who died, with their nationality :—

Table II.

Province	Number of Cases and Deaths		Nationality											
			Sinhalese		Moors		Tamils		Malays		Immigrants		Others		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Western ..	1	1	—	—	—	—	—	—	—	—	1	1	—	—	1	1
Central ..	7	5	—	—	—	—	—	—	—	—	7	5	—	—	7	5
N.-Central	38	17	—	—	38	17	—	—	—	—	—	—	—	—	38	17
Total ..	46	23	—	—	38	17	—	—	—	—	8	6	—	—	46	23

Malaria.[1]—There has also been a marked falling off in the admission in the hospitals for malaria, but the deaths from the disease are half per cent. higher for 1903 than for the year previous.

Small-pox.—There were 29 cases of small-pox, with 5 deaths; they occurred in the Western, Central and North-western Provinces. Three cases came from Indian ports, 3 from Singapore, 7 from Colombo city, the others from out-stations and estates. Of the 29 cases, 7 were unvaccinated, 21 vaccinated, and 1 re-vaccinated. Of the deaths, 4 were unvaccinated and 1 vaccinated.

Chicken-pox.—There were 1,862 cases, with 4 deaths, reported. Most of these cases were treated in their own homes.

[1] Please see remarks on this disease under the heading, "Meteorological Condition and its Relationship to Disease."

Measles.—This disease did not assume any alarming proportions in any of the towns or villages.

Dysentery.—There were 2,384 admissions for this disease in the hospitals. The Western, Central and Sabaragamuwa Provinces were responsible for the largest numbers. The Eastern and North-Central Provinces had the fewest cases. The deaths in hospitals from this disease were 658, a percentage death-rate of 27·6. In the jails, 636 cases were admitted, with 20 deaths, a percentage death-rate of 3·14. The jails in the Colombo district contributed 445 out of the total jail admissions for this disease. December and January are the worst months for dysentery, and the reason of this, in my opinion, is due to the comparatively cold nights producing chills. Cholera belts and flannel shirts have been recommended for prisoners during this season. The above figures are instructive, as showing the much smaller death-rate in those who, like prisoners, are treated early. There is an order in the jails that any prisoner using a latrine more than twice in twenty-four hours must be seen by a medical officer.

Leprosy.—The total number of cases reported during the year was 589, against 560 in 1902, being an increase of 29 cases. The following is a return of lepers treated at hospitals and dispensaries, excepting those who were treated at Hendala and Kulmunai :—

TABLE III.

	1902.	1903.
Western Province	32	10
Central Province	28	27
Northern Province	9	1
Southern Province	29	17
Eastern Province	6	26
North-western Province	—	1
North-Central Province	—	1
Province of Uva	4	—
Province of Sabaragamuwa ..	40	28
Total ..	148	111

Four hundred and forty-seven cases were treated in the Leper Asylum, Hendala, and 31 in the Kalmunai wards. The new cases were admitted from the following places to the asylum at Hendala :—

Western Province	38
North-Central Province	1
Southern Province	16
Province of Uva	3
Province of Sabaragamuwa	10
Total	68

The Western Province, which includes the Colombo district, shows the largest number of cases. The Leper Ordinance has been in force two years. One hundred and twenty cases were reported during 1903 and 113 in 1902. Many have been accommodated in the asylum, and some have been isolated in their own homes, where conditions existed which allowed this.

There are 207 known lepers throughout the Island, whose names and addresses are registered, and who are periodically examined. They are in the non-contagious stage of the disease, and there is no room at present for them in the leper institutions. The approximate leper population may be put down at about 616.

A considerable increase in the accommodation for lepers will have to be made at Hendala, if they are all to be segregated. The extension of the female section is urgently required; this can be done by appropriating male ward 1 for females. Three new male wards to contain 50 beds each are also badly required, but more accommodation still will be required if all cases have to be isolated. The acquisition of more land for building purposes has quite recently been made. There are no punishment cells at Hendala; a few are required.

Kalmunai Leper Wards.—At this institution 31 lepers were treated during the year, of whom 18 were discharged relieved, 4 died, and 9 remained under treatment at the end of the year.

Ankylostomiasis.—This disease is constantly introduced from India by Malabar coolies, and is spread owing to their careless habits. This disease is on the increase. There were 1,775 admissions in all hospitals, with 272 deaths. The largest number was treated in the General Hospital, Colombo, viz., 756 admissions, with 38 deaths. A large number of cases occur in the planting districts. The danger of the disease exists in the profound anæmia, which so lowers the vitality that the victim is carried off by practically any intercurrent complaint. Improved sanitation is the principal means by which this disease may be combated. Proper latrines and the proper disposal of human excreta, if introduced into the planting districts, would check the waste of labour from this disease. Although only 1,775 cases were admitted into the hospitals, there are hundreds of coolies with this disease on them doing their daily work, and daily spreading the disease to others by fouling the soil and water-courses. It is a matter of impossibility to provide accommodation for all these cases in the hospitals, but much could be done on estates in the way of treatment.

Parangi.—This is essentially a disease of poverty. Whether it is a variety of syphilis or not, the fact remains that the better-nourished people of this Island do not suffer from it. As food becomes more easily obtainable by the extension of irrigation, and as sanitary methods become more generally known, this disease will show a marked decrease. The death-rate is remarkably small; out of 3,254 admissions for this disease during the year there were only 11 deaths.

Malignant Diseases.—There were 237 cases reported for the year, made up of 222 cases of "cancer" and 15 of "sarcoma."

Plague.—The same precautions against plague were continued during the year as have been in use for several years past. The Plague Committee has had fortnightly meetings. Plague hospitals at remote stations are not now kept up, but sites are ready and building materials at hand in case of necessity. On March 5th, 1903, a case of plague was landed from s.s. "Maria Valerie" at the Southern Plague Hospital, Galle; the patient was discharged cured on April 29th, 1903. The contacts were segregated and placed in quarantine for the full period of ten days.

Galle continues to be the plague port. The buildings at the plague hospital and the segregation camp are

fully equipped and ready for use at a moment's notice. A new disinfecting depôt has been established on the foreshore, where coolies who work on ships in quarantine can be disinfected, and where there is a steam disinfecting machine for the disinfection of soiled clothes. Accommodation is also provided for the disinfection of male and female saloon passengers.

The destruction of rats at the ports of Colombo and Galle was carried out during the year, with fumigation of cargo boats.

TABLE IV.—*Comparative Statement of Principal Diseases for the last Five Years.*

Year.	Cases.	Deaths.	Year.	Cases.	Deaths.
	Cholera.			*Enteric Fever.*	
1899	—	—	1899	170	61
1900	814	456	1900	224	77
1901	152	97	1901	292	74
1902	179	116	1902	243	63
1903	46	23	1903	358	71
	Small-pox.			*Leprosy.*	
1899	334	56	1899	506	53
1900	252	42	1900	635	43
1901	390	75	1901	518	56
1902	146	35	1902	483	48
1903	29	5	1903	526	92
	Chicken-pox.			*Ankylostomiasis.*	
1899	1,211	1	1899	1,255	234
1900	935	—	1900	1,336	273
1901	1,762	6	1901	1,691	326
1902	2,292	3	1902	1,609	257
1903	1,862	4	1903	1,775	272
	Measles.			*Parangi.*	
1899	29	1	1899	3,080	10
1900	23	—	1900	3,646	9
1901	44	—	1901	3,117	12
1902	196	2	1902	3,434	10
1903	20	—	1903	3,254	11
	Dysentery.			*Malarial Fever.*	
1899	2,639	930	1899	8,305	697
1900	3,204	934	1900	6,226	147
1901	4,177	1,543	1901	5,665	89
1902	3,017	999	1902	6,513	115
1903	2,384	658	1903	4,766	108

Table V. gives figures for 1902 and 1903 for comparison :—

TABLE V.—*Table showing the Primary and Revaccination in the Island during* 1902 and 1903.

	1902.	1903.
Primary vaccination :—		
Number vaccinated	142,141	146,428
Successful	121,273	126,538
Unsuccessful	9,382	11,008
Unknown	11,486	8,882
Revaccination :—		
Number vaccinated	7,760	4,510
Successful	4,652	3,013
Unsuccessful	1,500	799
Unknown	1,608	698
Primary vaccination :— Percentage of successful to total inspected	92·81	91·99
Revaccination :— Percentage of successful to total inspected	75·61	79·03

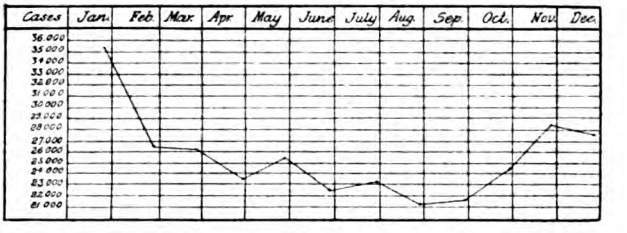
Vaccination.—During the year 150,938 subjects were vaccinated : 146,428 were primary vaccinations, and 4,510 revaccinations. Of the former, 126,538 were successful and 11,008 unsuccessful, and in 8,882 subjects the result of the operation was not known, as they failed to present themselves for examination on the appointed days. The percentage of successful cases to total inspected was 91·99. Of the revaccinations, 3,013 were successful and 799 unsuccessful, and the result was not known in 698 cases, as the subjects failed to present themselves for inspection. The percentage of successful cases to total inspected was 79·03. The Central Calf Vaccine Depôt at Colombo was opened on August 11th, and glycerinated calf lymph was supplied in sufficient quantities to all parts of the Island. The other depôts were closed during the year. The inhabitants of the Island are well protected against small-pox, and to this cause is due the prevention of the spread of this disease from the various foci that existed during the year.

III.—METEOROLOGICAL CONDITION AND ITS RELATIONSHIP TO DISEASE.

For the purposes of this report it has been thought advisable to roughly divide the Island into eastern and western portions. The eastern contains the districts affected by the north-east monsoon and the western by the south-west monsoon. The figures show the total number of cases of disease, number of cases of malaria and of dysentery, and the rainfall of the districts.

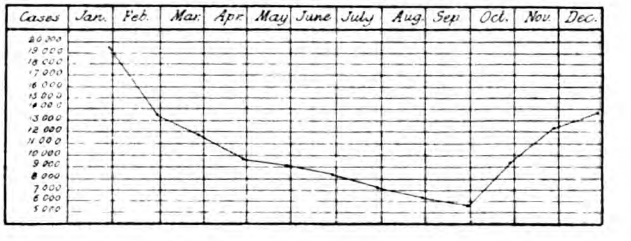
(*a*) *The Malaria in the East.*—Chart I. shows the

Chart I. *Total Diseases in the East, 1903.*



curve of total disease in the eastern portion of Ceylon. It will be noticed that it is similar to the curves of previous year. Highest in January and having a slight rise in May, it begins its proper rise in October.

Chart II. *Malaria in the East, 1903.*



The malarial curve, Chart II., shows that malaria is the disease which mainly produces the fluctuations in the curve of general disease in this part of Ceylon ; it is not responsible for the rise in May, and Chart III. shows that dysentery is the cause of this rise.

Chart IV.—The rainfall is quite different from preceding years, in which it has always risen to a maximum in November, while in this year its maximum is December. This alteration in the rainfall has altered

the December rise of malaria, and hence has altered the total disease curve in a way not shown in previous years. The sudden rise in December of the rain curve is associated with a slowing of the rise of the malaria curve, and even a fall of the total disease.

Chart III. *Dysentery in the East, 1903.*

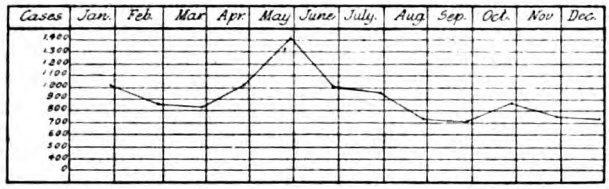


Chart IV. *Rainfall in the East, 1903.*

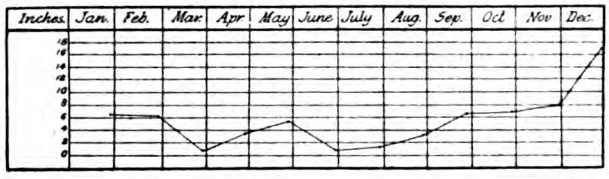
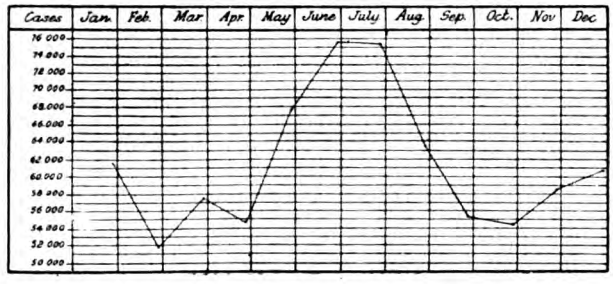


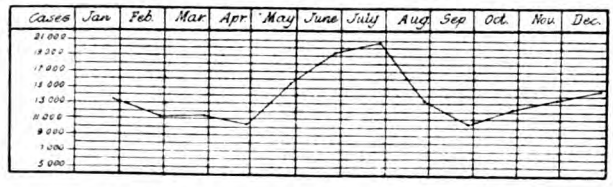
Chart V. *Total Diseases in the West, 1903.*



(*b*) *The Malaria in the West.*—Chart V. shows the total disease curve in the west, and is different from the previous years in having a large rise in June and July.

The rise is shown by Chart VI. (the malarial curve

Chart VI. *Malaria in the West, 1903.*



in the west) to be caused principally by malaria. This rise commences in May and reaches its maximum in June for total disease and in July for malaria. In causing this rise malaria is assisted by dysentery (Curve VII.), which commences its rise earlier, reaches its maximum in May, and falls through June without affecting the total disease curve because the malarial increase is marked, but its July fall causes a slight fall of the total disease curve, although the malarial curve continues to rise. Generally January is the great malarial month, and this is not so in 1903. The general malarial rise in 1903 is during and after the May rainfall, and the other rise is in November and December, after the October rainfall.

Chart VII. *Dysentery in the West, 1903.*

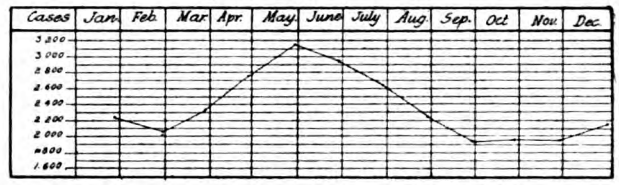
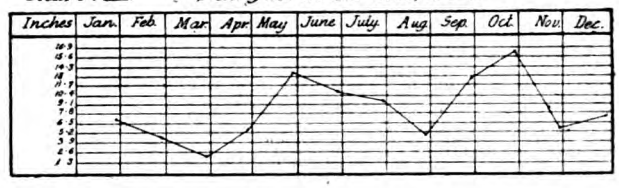


Chart VIII. *Rainfall in the West, 1903.*



General Remarks.

It will thus be seen that in the eastern portion of the Island, affected by only the north-east rainfall, the malarial curve is related to the rainfall, and produces a powerful effect upon the general disease curve. The relationship to the rainfall is that the malarial curve, rising through October, November and December, reaches its maximum in January. This, I am sure, is related to the development of the Anopheles, for December and January are the great months for mosquitoes and January for malaria. The mosquitoes developing and increasing in number during and after the rain, spread the infection.

The relationship in the west is not so clear, as the influence of the two monsoons exists. Still, generally speaking, January represents the north-east influence, and May or June the south-west with regard to malaria.

IV.—General Sanitary Condition of the Colony and of the Chief Towns.

The general sanitary condition of the Island remains in much the same condition as last year. The same methods of disposal of sewage and refuse exist, and, though by no means satisfactory, are still far from bad when compared with other tropical countries. The water supply is often very good, and steps are being taken every year to remedy defects.

Colombo.—This city has had its sanitary staff considerably augmented recently. There are two specially qualified Medical Officers of Health, with a staff of Inspectors, in the employment of the Municipality. The disposal of sewage is the same as it has been for some years past, viz., the collection of solid matters for burial at various depôts, and the continuance of cesspits; the latter are being gradually filled up and closed. Colombo has contributed the largest number of cases of enteric fever, and in most cases the origin of the disease has been traced to contaminated water or milk.

The scavenging of the town is defective. Road sweepings and refuse are deposited over grass-fields

immediately outside the residential quarter; these harbour flies, which most likely carry infection. A proper cinerator or a series of cinerators should be erected by the Municipality for the destruction of all sweepings and refuse, and the heat generated should be available as a motive power for electric lighting. The dust in Colombo is a nuisance and a danger; there is too little watering and sweeping of the streets and of the collection and removal of the dust.

A beginning has been made towards introducing a water carriage system for sewage on Mr. Mansergh's scheme. The water supply of Colombo is deficient, but this is in process of being remedied. On the whole, Colombo is healthy for a tropical city. Much is being done in the way of improved sanitary measures, but a great deal is still required; *e g.*, the question of overcrowding, the removal of insanitary areas, surface drains, and cesspits.

The Colombo lake is a perennial source of anxiety, it is practically a receptacle for sewage, and during drought its level falls a good deal, exposing offensive muddy sides. It is also the breeding ground for myriads of small irritating flies. My idea is that it should be drained, and the area converted into an open space.

The notification of infectious diseases has been more satisfactory during the past year.

Kandy.—The general sanitary state of Kandy leaves considerable room for improvement. Several cases of enteric fever occurred in the town from insanitary causes. The drainage is imperfect. An improved scheme of drainage, it is reported, is under consideration. The water supply is sufficient and of good quality. The conservancy of the town has been improved, but several cesspits remain. Alleys are ill-ventilated, insanitary, and overcrowded.

Jaffna.—Jaffna is the only town in the Northern Province where sanitation is carried on to some extent, but even here a good deal of improvement is required. As it is the chief town of an important, populous, and rich Province, it should possess a local board or municipality.

Water for all purposes is obtained chiefly from wells, but the majority of them contain hard, brackish water, unfit for drinking. The water supply of Jaffna is most unsatisfactory, but a special public works department officer is at the present time surveying and making estimates for a better supply. I have not had any of the details sent to me.

Galle.—This town is in a fairly sanitary condition, the Fort especially showing considerable improvement after the closing of cesspits and the introduction of the dry-earth system in private houses. In the other divisions of the municipality much remains to be done in this direction. The water supply of the town is very defective.

Batticaloa.—The sanitary condition of Batticaloa is fairly satisfactory, but there is much room for improvement. A better system of drainage is required, but owing to the nature of the land, which is flat, this is a matter of some difficulty. The compounds should be kept cleaner, and swamps and marshy grounds drained and filled up. The water supply, which is drawn from wells, is ample, but some of the wells in the dry season are apt to fail.

Kurunegala.—The sanitary condition is not satisfactory. A water supply and drainage scheme are badly wanted; the latter and public markets will be taken in hand by the Local Board soon.

Anuradhapura.—The principal town of the North-Central Province formerly had a reputation for unhealthiness, but of recent years, owing to improved sanitary measures, the health of the inhabitants has wonderfully improved.

Badulla.—The water service is satisfactory. The drainage is defective. The scavenging was satisfactorily done. Public latrine accommodation is deficient.

Ratnapura.—The sanitary condition is not satisfactory. The drainage has not been improved. The water supply is said to be satisfactory.

V.—Medico-Legal.

Medico-Legal Duties.—During the year 1903, 230 analyses were conducted, of which 122 were judicial, 23 were samples of kerosine oil, 6 were samples of fuel oil, and 38 were samples of water, spirits, eau-de-cologne, arrack, cinnamon, oil, &c., from His Majesty's Customs, Local Boards, and the Railway Department, and 41 were samples of water conducted at the request of the Government. Of the 122 judicial analyses, 72 were undertaken for the detection of poisons and 50 for examination of stains. In the poisoning cases arsenic was detected in 5, arsenic and croton oil in 1, croton oil in 1, lead in 1, mercury in 4, copper in 1, magenta in 1, ammonia in 1, canabis indica in 13, opium in 4, opium and ganja in 1, atropine in 1, alcohol in 1, niyangala (*Gloriosa superba*) in 1, and in the rest of the analyses no poisons were detected.

A synopsis of the analyses for the year in a tabular form is herewith annexed:—

Synopsis of the Analyses for 1903.

Total, 230 Fees, Rs.1,837·50	Judicial	122	50	Mammal blood	29
				Spermatozoa	4
				No blood or seminal fluid	17
			72	Arsenic	5
				Arsenic and croton oil	1
				Croton oil	1
				Lead	1
				Mercury	4
				Copper	1
				Magenta	1
				Ammonia	1
				Canabis indica	13
				Opium	4
				Opium and ganja	1
				Atropine	1
				Alcohol	1
				Niyangala (*Gloriosa supberba*)	1
				No poisons	36
					122
	Kerosine oil				23
	Fuel oil				6
	Water, spirits, eau-de-cologne, arrack, cinnamon oil, from His Majesty's Customs, Local Boards, and the Railway Department				38
	Analyses for Government purposes				41
				Total	230

VI.—Administrative Hospitals and Asylums.

The Government medical institutions are, as a rule, well built, either of stone or of brick, and contain large, airy wards, with plenty of cubic space and superficial area. The general type of hospital is an administration block in front with wards running at right angles to it, connected by covered corridors. The buildings consist of a ground floor only, and they occupy a good deal of space. The roofs are of red tiles, and the floors of cement concrete. The beds are of wood with cane bottoms, or of iron with copper spring mattresses; bedside tables are provided, and the fittings and equipment are serviceable, and, in some of the institutions, fairly up to date. All the hospitals have separate accommodation for women, and at many of them there are isolation wards.

In many of the hospitals there is no operating room. This defect is being attended to, and in some there are no residential quarters for the medical staff, nor accommodation for nurses. It is my object to improve the quality of the surgical instruments, and to gradually introduce modern appliances and aseptic furniture. A large number of good operating tables have been made locally and distributed to many of the institutions.

There is the great want in Colombo of a modern infectious diseases hospital. The present establishment consists of a series of cadjan huts, which have been yearly patched up since they were originally erected over twenty years ago. Their only advantage is that for sanitary reasons, when necessary, they can be destroyed by fire without much loss of money, for it is quite impossible to disinfect them, and their rough interior walls are most unsuitable for infectious wards from a hygienic point of view. I hope in the near future that a permanent hospital for infectious diseases on the pavilion plan, and with accommodation for paying patients, will be provided.

Native Attendants.—Male and female ward attendants are employed in the hospitals, who work under the directions of the nurses; they perform their duties fairly satisfactorily, but it would be well if a better class of attendant could be induced to take up the work, as many of those now employed are very ignorant and quite illiterate.

Nursing in Ceylon Hospitals.—The nursing in the Ceylon hospitals is not entirely satisfactory. Some of the out-station hospitals have no nurses; other hospitals are under-nursed. The question of improving this service is now under the consideration of Government. The nursing staff consists of—

4 European qualified nurses.
23 European Roman Catholic Sisters (untrained).
3 European Anglican Sisters (untrained).
1 European matron (untrained).
27 matrons (trained locally).
45 nurses (trained locally).

Three of the European qualified nurses are employed in the paying section of the General Hospital, Colombo. The fourth is the matron of the Lady Havelock Hospital. Two more European qualified nurses are expected in 1904. The Roman Catholic Sisters perform nursing duties in the general wards of the Colombo hospital and at Kurunegala. The Anglican Sisters are employed at the Kandy Hospital.

Two nursing schools for the training of young women exist at the Lady Havelock Hospital and the Kandy Hospital. The length of the course is two years, after which a certificate of proficiency is given to those who pass a satisfactory examination.

During the year 1903, 66 hospitals and asylums were in operation. The Immigrant Hospital at Puliyadirakkam was closed on December 31st, 1902, and the one at Pesalai was closed on March 1st, 1903. The lock hospital at Mahaiyawa was closed on December 31st, 1903. The Civil Hospital at Mulhalkele was closed in December, 1902, and was reopened in June, 1903, for the fever season.

Numbers Treated.—In the 32 Civil Hospitals, including the Lying in Home, there were 40,553 cases treated, with 3,433 deaths, being 3,420 cases and 265 deaths less than in the previous year. The daily average sick was 1,553·53, as against 1,652·51 in the previous year. In the eight Field Hospitals there were 4,105 cases treated, with 129 deaths, against 4,426 treated and 171 deaths during the previous year. The daily average sick was 179·59, against 179·46 in 1902. The number treated in the four immigrant hospitals was 1,318, against 1,855 in 1902; the deaths numbered 63, against 84 in the previous year. The daily average sick was 60·71, against 73·49 in 1902. In the twenty District Hospitals 13,081 cases were treated, against 14,928 in 1902. There were 1,859 deaths, against 2,510 in the preceding year. The daily average sick was 750·19, against 792·41 in 1902.

Surgical Operations. — At the various hospitals throughout the Island 2,172 operations were performed, with 72 deaths. The following is a summary of the operative work:—

Amputations:—	Cases.	Deaths.
Upper extremities	80	1
Lower extremities	27	2
Operations for cataract	73	—
Iridectomy	20	—
Radical cure for hernia	35	1
Radical cure for hydrocele	98	—
Hepatic abscess	36	12
Trephining of skull	30	2
Lithotomy, supra-pubic	6	1
Lithotomy, perineal	1	—
Laparotomy	17	7
Ovariotomy	11	3
Cæsarian section	1	—
Other eye operations	63	—
Other operations	1,674	43
Grand total	2,172	72

General Hospital, Colombo.—The total number of patients treated at this institution during the year was 14,606, with 1,138 deaths, against 16,035 cases and 1,101 deaths in the previous year. Of the total treated, 455 remained from the previous year and 14,151 were new admissions; 13,047 were discharged, and there remained 421 under treatment at the end of the year. The daily average sick was 486·82, and the percentage of deaths to total treated was 7·79. The institution consists of twenty-five wards and eight solitary rooms, and the number of beds is 425. An administration block, with quarters for the medical and nursing staff, is in course of construction, and will, when completed,

improve to a considerable extent the usefulness of the institution.

Paying Section, General Hospital, Colombo.—This consists of the wards "Planters'" (4 wards with 4 beds), "Anthonisz" (2 wards with 2 beds), "Passengers'" (8 wards with 8 beds), "Seamen's" (3 wards with 26 beds), "Clerical" (1 ward with 2 beds), and "Cargill's" (2 wards with 2 beds). The total number of patients treated in these wards during 1903 was 523, with 55 deaths, against 577 cases and 41 deaths in 1902. Of the total treated, 16 remained from the previous year and 507 were new admissions; 448 were discharged, and there remained 20 under treatment at the end of the year. The daily average sick was 26·34, against 27·61 in 1902, and the percentage of deaths to total treated was 10·51, against 7·11 in 1902.

Houses of Observation for Suspected Lunatics.—There are four institutions of this nature at Colombo, Kandy, Galle, and Jaffna, and into the first three were admitted for observation 323 patients, which, with 20 remaining from the previous year, made a total of 343, of whom 78 were transferred to the asylum at Colombo, 252 were discharged, 3 died, and 10 remained at the end of the year. There were no admissions to the House of Observation at Jaffna.

Lunatic Asylum, Colombo.—At the beginning of the year there remained 316 males and 167 females, total 483 cases. During 1903, 151 cases (103 males and 48 females) were admitted, the total number under treatment being 634 (419 males and 215 females). Of these, 49 males and 26 females, 75 in all, were discharged, and 39 males and 12 females, 51 in all, died.

The daily average was 488·37 (males 317·34, females 171·03), an increase of 6·92 as compared with the previous maximum average. This increase affects only the male division, which was already overcrowded.

The institution consists of 18 dormitories, 20 day-rooms and corridors used as day-rooms, and 134 single rooms. The water supply is drawn from the Labugama reservoir, which supplies the town. The quality is good. The Superintendent (Dr. J. B. Spence) complains of the inadequate supply of water; it is hoped that with the duplication of the main from Labugama this complaint will cease. There are 19 lavatories, 17 baths, and 19 latrines. The dry-earth system is carefully carried out. The number of patients secluded under lock and key was 8, and the number of times seclusion was resorted to was 190, and the longest duration in any single instance was six hours. There was one case of accidental injury to a patient by an attendant, another case of serious injury by a patient to another patient; other cases of injury have been rather unusually numerous, some being accidental in origin and others being due to the action of fellow-patients. No case of suicide occurred during the year. Such patients as are well enough are given daily exercise, while others are confined to the airing courts. Outdoor sports (cricket and tennis), as well as indoor games (cards, bagatelle, musical instruments, &c.), are provided. A gramophone was purchased last year from industrial funds. A library is in existence, and those who can read are regularly supplied with books and papers, but it has not been availed of to any large extent. The inmates of the Asylum are employed in gardening, trade, housework, &c, and the proceeds of their industry is formed into a fund, which at the end of the year amounted to Rs. 18,900·40.

The Lunatic Asylum has reached the limit of its accommodation, overcrowding is constant, and the question of providing more buildings is a pressing one.

Leper Asylum, Hendala.—The Leper Asylum received 136 patients for treatment during the year, which, with 311 remaining from the previous year, made the total 447. The daily average in the Asylum was 290·83. Of the total treated, 75 left, of whom 48 absconded and were reported to Government Agent and Police, and subsequently arrested and brought back to the Asylum. Nine lepers were discharged and permitted home isolation, subject to the regulations framed under the Leper Ordinance. One Tamil immigrant was sent back to his village in South India. There were 83 deaths, giving a percentage of 18·56 to total treated. Two hundred and eighty-nine cases remained under treatment at the end of the year.

De Soysa Lying-in Home.—The total number of patients treated at this institution during the year was 818, against 737 in 1902, 499 in 1901, and 163 in 1890. Of these, 775 were discharged cured, 2 removed by relatives, 5 transferred to the General Hospital, 17 died, and 19 were remaining under treatment at the end of the year. The daily average sick was 18·52. The percentage of deaths to total treated was 2·12, against 1·25 in 1902, ·80 in 1901, and 3·08 in 1890. The popularity of the institution is daily increasing, specially with the Mohammedan patients, whose admissions are increasing year by year. The increase of this caste from 20 in 1902 to 32 in 1903 is a substantial one.

The following operations were performed during the year:—

Class.	Division.	Subdivision.		
Forceps	Difficult	Brow	3	
		Head	115	
	Complex	Twins	4	
		Prolapse of cord	4	
	Preternatural / Compound	Head and hand	10	
				136
Version, podalic	Complex	Placenta prævia	6	
		Transverse	14	
	Premature birth	Small head	4	
				24
Craniotomy	Difficult	Hydrocephalus (head)		3
Evacuation of uterus	Abortion	Removal of placenta and ovum		20
Separation and removal of placenta	Complex	Morbidly adherent placenta		10
Acceleration of labour by water bags	Complex	Placenta prævia		6
Abdominal section and Baer's operation				1
Puerperal eclampsia				6
		Total		206

In the Lying-in Home 23 pupil midwives receives training in 1903, of whom 17 obtained certificated

after passing a satisfactory examination. A scheme to train selected pupils from all provinces has been adopted, and it is hoped that it will be the means of introducing European midwifery into the villages.

Lady Havelock Hospital.—In this institution 1,137 patients were treated, against 1,072 in 1903. Thirty-one remained from the previous year, and 1,106 were new admissions. The daily average sick was 34·06. Nine hundred and ninety-four patients were discharged. There were 111 deaths, and 32 remained under treatment at the end of the year. Of the 1,137 patients, 351 were children (124 boys and 227 girls). There were 49 operations performed, with 3 deaths. The number of cases of diseases peculiar to women was 164, as compared with 147 in 1902. The total number of Mohammedans was 83. There were 12 paying patients, as compared with 10 in 1902. Of these, 6 were Europeans, 2 Burghers, 1 Tamil, 2 Sinhalese, and 1 American.

Police Hospital, Colombo.—Eight hundred and forty-five patients were treated in the Police Hospital, of whom 838 were discharged after treatment, 1 died, and 6 remained at the end of the year. The daily average sick was 13·35. At the outdoor dispensary of this hospital 2,200 persons were treated during the year, who paid 2,469 visits.

Grenier Eye, Ear, and Throat Infirmary.—At this institution 6,602 cases were treated during the year, against 4,927 in the previous year. The contributions during the year amounted to Rs. 126·20, and were of a purely voluntary nature.

Branch Hospitals.—Colombo, Kandy, and Galle are provided with a special hospital for the treatment of women suffering from venereal diseases. The total number of new cases admitted was 289, which with 18 remaining from the previous year make a total of 307, against 371 in 1902. Of these, 290 were discharged, 2 died, and 15 remained at the end of the year. Of the 307 females in the three Branch Hospitals, 30 were treated for primary syphilis, 53 for secondary syphilis, 72 for tertiary syphilis, 4 for inherited syphilis, 113 for gonorrhœa, and the rest for other diseases, the result of venereal poison. The patients seek voluntary admission.

Jail Hospitals and Sick Prisoners.—The number of prisoners admitted to the different jails in the Island was 13,797. The average daily strength of prisoners was 2,784. The number treated in the jail hospitals during the year was 4,396, against 5,363 in the previous year. The total deaths numbered 73, against 117 in 1902.

RETURN OF DISEASES IN JAIL HOSPITALS FOR 1903.

Diarrhœa	Cases	850
	Deaths	7
Malarial fever	Cases	796
	Deaths	3
Enteric fever	Cases	26
	Deaths	4
Other fevers	Cases	34
	Deaths	—
Injuries	Cases	219
	Deaths	—
Leprosy	Cases	2
	Deaths	—

The following table gives the number of admissions, number of deaths, average strength, death-rate to admission to hospitals, and to average strength for the past four years :—

Year	Admissions to Hospitals	Number of Deaths	Average Strength of Prisoners	Death-rate to Admissions	Death-rate per 1,000 of Average Strength
1900	4,465	102	2,515·14	2·28	40·55
1901	4,638	112	2,752·71	2·41	40·69
1902	5,363	117	2,656·40	2·18	44·05
1903	4,396	73	2,784·00	1·66	26·21

Kanatta Infectious Diseases Hospital. — At this institution 11 cases of infectious diseases remained from the previous year, and 316 were admissions, making a total of 327. Of these, 303 were discharged cured, 4 died, and 20 remained. The death-rate was 8·50 per cent., against 8·77 per cent. in 1902. Of the 327 patients, 14 were treated for small-pox, 203 for chicken-pox, 89 for measles, 5 for whooping cough, 15 for mumps, and 1 was under observation for cholera. Of the 14 cases of small-pox, 2 died. There were no admissions into the segregation hospital at Borella.

The following two institutions are not entirely supported by, but receive a large subsidy from, the Government :—

(1) *The Friend-in-Need Society's Hospital at Jaffna.*—The Friend-in-Need Society's Hospital at Jaffna received 2,094 patients, which with 73 remaining from the previous year made a total of 2,167. Of these, 2,020 were discharged, 85 died, and 62 patients remained at the end of the year. At the outdoor dispensary of this institution 10,575 persons were treated during the year, who paid 20,328 visits.

(2) *The Victoria Home for Incurables, Colombo.*—The statement of admissions and deaths is annexed :—

Disease	Number Remaining on December 31, 1902	Yearly Total, 1903		Total Cases Treated	Remaining at the End of December, 1903
		Admissions	Deaths		
Paralysis	36	8	3	44	41
Congenital deformity	1	—	—	1	1
Leucoderma	1	—	—	1	1
Epilepsy	2	—	—	2	2
Elephantiasis	1	—	—	1	1
Optic atrophy	1	—	—	1	1
Asthma	2	—	—	2	2
Fracture	1	—	—	1	1
Accident	1	—	—	1	1
Lupus	1	—	—	1	1
Phthisis	—	1	—	1	—
Cancer	—	1	1	1	1
Chronic rheumatism	3	—	2	3	1
Total ..	50	10	6	60	54

(*To be continued in next Journal.*)

Return of Diseases and Deaths in 1903 at the following institutions: Lunatic Asylum, Jawatta; Leper Asylum, Hendala; Leper Hospital, Kalmunai; De Soysa Lying-in Home; Lady Havelock Hospital, Colombo; General Hospital, Colombo; Civil Hospitals, Panadure, Kalutara, Negombo, Kandy, Katugastota, Gampola, Matale, Nuwara Eliya, Mulhalkele, Vavuniya, Mullaittivu, Mantota, Point Pedro, Galle, Hambantota, Matara, Balapitiya, Tangalla, Batticaloa, Trincomalee, Kurunegala, Puttalam, Marawila, Chilaw, Anuradhapura, Badulla, Ratnapura, and Kegalla; District Hospitals, Avisawella, Neboda, Dikoya, Lindula, Uda Pussellawa, Kelebokka, Maskeliya, Deltota, Nawalapitiya, Teldeniya, Ramboda, Dimbula, Pussellawa, Deniyaya, Haputale, Lunugala, Rakwana, Balangoda, and Karawanella; Immigrant Hospitals, Dambulla, Mannar, Pesalai, and Mihintale; Field Hospitals, Maha-oya, Nikaweratiya, Dandugama, Alutnuwara, Medagama, Buttala, Godakawela, and Kolonna.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	38	1	38
Anæmia	397	39	407
Beri-beri	17	9	17
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	111	—	112
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Debility	3542	449	3685
Delirium Tremens	9	1	9
Dengue	—	—	—
Diabetes Mellitus	42	2	45
Diabetes Insipidus	23	11	25
Diphtheria	1	1	1
Dysentery	2294	658	2384
Enteric Fever	336	71	358
Erysipelas	79	15	86
Febricula	56	3	58
Filariasis	—	—	—
Gonorrhœa	792	1	816
Gout	—	—	—
Hydrophobia	7	2	7
Influenza	418	4	427
Kala-Azar	—	—	—
Leprosy—			
(*a*) Nodular	29	15	102
(*b*) Anæsthetic	55	32	178
(*c*) Mixed	104	45	246
Malarial Fever—			
(*a*) Intermittent—			
Quotidian	2351	23	2414
Tertian	486	7	498
Quartan	1287	14	1319
Irregular	208	43	214
Type undiagnosed	101	6	107
(*b*) Remittent	210	15	214
(*c*) Pernicious	—	—	—
(*d*) Malarial Cachexia	3215	576	3457
Malta Fever	—	—	—
Measles	20	—	20
Mumps	14	—	14
New Growths—			
Non-malignant	297	7	310
Malignant	256	33	263
Old Age	193	68	215
Other Diseases	311	29	324
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	24	13	26
Rachitis	—	—	—
Rheumatic Fever	5	—	5
Rheumatism	2093	16	2170
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	2	1	2
Septicæmia	48	22	48
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox	3	—	3
Syphilis—			
(*a*) Primary	944	2	998
(*b*) Secondary	547	6	581
(*c*) Tertiary	166	6	177
(*d*) Congenital	57	6	60
Tetanus	64	32	66
Trypanosoma Fever	—	—	—
Tubercle—			
(*a*) Phthisis Pulmonalis	964	267	1004
(*b*) Tuberculosis of Glands	41	14	42
(*c*) Lupus	22	—	22
GENERAL DISEASES—*continued*.			
(*d*) Tabes Mesenterica	16	4	24
(*e*) Tubercular Diseases of Bones	5	1	6
Other Tubercular Diseases	—	—	—
Varicella	—	—	—
Whooping Cough	10	1	10
Yaws	3073	11	3254
Yellow Fever	—	—	—

LOCAL DISEASES.

Diseases of the—			
Cellular Tissue	1597	99	1661
Circulatory System—			
(*a*) Valvular Disease of Heart	121	33	126
(*b*) Other Diseases	77	15	81
Digestive System—			
(*a*) Diarrhœa	2868	935	3009
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	182	5	185
Congestion of Liver	—	—	—
(*d*) Abscess of Liver	34	16	35
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	79	11	83
(*g*) Cirrhosis of Liver	94	32	100
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	2006	174	2085
Ear	76	1	79
Eye	635	17	670
Generative System—			
Male Organs	970	5	1002
Female Organs	1708	44	1742
Lymphatic System	557	10	577
Nervous System	958	182	1452
Nose	68	—	68
Organs of Locomotion	300	14	314
Respiratory System	3097	585	3197
Skin—			
(*a*) Scabies	446	3	455
(*b*) Ringworm	50	—	51
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	411	2	425
(*f*) Other Diseases	5734	59	6039
Urinary System	525	82	547
Injuries, General, Local—			
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	8	1	8
(*c*) Other Injuries	6868	417	7087
Parasites—			
Ascaris lumbricoides	425	13	435
Oxyuris vermicularis	1	—	1
Dochmius duodenalis, or Ankylostoma duodenalis	1662	272	1775
Filaria medinensis (Guinea-worm)	10	—	10
Tape-worm	—	—	—
Poisons—			
Snake-bites	10	1	11
Corrosive Acids	2	—	2
Metallic Poisons	8	—	8
Vegetable Alkaloids	21	2	21
Nature unknown	15	1	15
Other Poisons	156	1	162
Surgical Operations—			
Amputations, Major	536	30	552
,, Minor	1258	40	1305
Other Operations	178	—	183
Eye	—	—	—
(*a*) Cataract	68	—	73
(*b*) Iridectomy	19	—	20
(*c*) Other Eye Operations	57	—	63

Total Deaths.—The total deaths numbered 5,622, against 6,560 in 1902, showing a decrease of 938. A table showing the death-rate in the various hospitals and asylums in the Island for the year as compared with the last year is annexed. For purposes of comparison the death-rates among the mixed races and Malabars have been shown separately :—

Hospitals	Mixed Races		Malabars		Total	
	1902	1903	1902	1903	1902	1903
Civil	5·59	6·12	16·01	15·86	8·18	8·47
Field	3·22	3·08	9·97	3·87	3·86	3·14
Immigrant	3·71	2·86	6·37	9·00	4·52	4·77
District	4·60	4·74	21·97	19·52	16·88	14·21
Asylums	7·49	10·26	8·37	10·80	7·61	10·33
Total ..	5·26	5·97	18·25	17·13	9·87	9·3

The percentage of deaths to cases treated in the Civil Hospitals showed a slight increase among the mixed races, and a slight decrease among the Malabars. In the Field Hospitals there was a slight decrease among the mixed races, and a decrease of 6·10 among the Malabars. In the Immigrant Hospitals the decrease among the mixed races was ·85, but among the Malabars there was an increase of 2·63. In the District Hospitals there was a slight increase among the mixed races, but among the Malabars there was a decrease of 2·45. Taking all the hospitals and asylums together, there was a slight increase in deaths among the mixed races and a decrease of 1·12 among the Malabars. The percentage of deaths to total treated was 9·3, against 9·87 during the previous year.

Hospital Accommodation.—This was generally sufficient; occasionally some overcrowding took place. This remark especially applies to the Leper Asylum at Hendala, for the extension of which steps are being taken, to the Lunatic Asylum, and to the General Hospital, Colombo.

Water Supply—The water supply—with the exception of the following institutions: Matale, Mannar, Galle, Chilaw, Nikaweratiya, Balangoda, Trincomalee—was reported to be good, pure, wholesome, and abundant. Water for drinking purposes is, as a rule, boiled and filtered before use. Water supply schemes for Nanu-oya, Balangoda, and Tillicoultry are under consideration.

Bathrooms.—All hospitals are provided with separate bathrooms for males and females, and furnished with tubs, which are filled with hot or cold water, according to the requirements of the patients. Patients who can help themselves, however, prefer to bathe in streams, where there are such adjoining a hospital.

Drains.—There are no covered drains. The drains are all surface ones for carrying away the ward washings, rain, and storm water.

Sewage.—The conservancy of the latrines is entirely on the dry-earth system, the excreta being removed daily and buried, or incinerated at some distance from the Hospitals. Doulton's earthenware squatting plates have been introduced in some of the hospitals.

Inspection.—The hospitals were all inspected either by me or the Colonial Surgeons of the respective Provinces. The number of these visits of inspection and the official designation of the visitors will be found given in the return of each institution. The books were produced when called for, and were generally found complete and made up to the date of examination. The reports of inspection by the Colonial Surgeons, as well as those by me, were forwarded to Government when necessary.

Food Supply.—The provisions for the various hospitals were supplied by purveyors on contract approved by Government. The system works satisfactorily. The Medical Officers in charge of the respective hospitals examine the food before it is served out to the patients, and reject such articles as do not come up to contract sample.

Dispensaries.—Four hundred and sixty-seven dispensaries, including branch institutions and visiting stations, were in operation. Of these, 297 were Civil, 44 District, and 126 Estate. They are distributed as follows: In the Western Province 33, Central 62, Northern 44, Southern 36, Eastern 32, North-Western 36, North-Central 39, Province of Uva 30, and Province of Sabaragamuwa 29, and on estates 126. In the Civil and District dispensaries there were treated 921,392 persons who paid 1,434,250 visits, against 975,160 persons who paid 1,499,227 visits in 1902.

Port Duties and Immigration. — The number of vessels which arrived at the Port of Colombo was 3,077, against 2,802 in 1902, 2,617 being steamers, 1 sailing ship, and 459 native craft. The number of native traders was 66,068 and coolies 47,858, against 60,672 and 33,760 in the previous year. Dr. Woutersz took up the duties of Senior Port Surgeon on October 10th, 1903.

Ragama Camp.—The number of coolies who passed through the camp during 1903 was 46,478, against 34,280 in 1902. There was only one fatal case of cholera there during the year. Of the number of coolies who passed through the camp, 2,493 were vaccinated, and the rest either had marks of successful vaccination or of small-pox.

De Soysa Bacteriological Institute.—Dr. S. C. Paul, F.R.C.S., was in charge of this institution till December 30th, 1903, when Dr. Aldo Castellani, M.D. (Florence), assumed duties as Director. The fees recovered amounted to Rs. 325·50, against Rs. 298 in the previous year.

Ceylon Medical College.—The College, in charge of Dr. Chalmers, M.D., F.R.C.S., contains lecture halls, laboratories for chemical physiology and pathology, physiology, biology and pathology, dissecting room, offices, photographic rooms, a museum and Colonial Medical Library, and a separate building for lady students containing sitting-room, lavatory, and special dissecting room. An extension is proposed for 1905 for students' common room, lecturers' lavatories, materia medica museum, a lecture hall, and a suite of laboratories for the Public Analyst.

From October, 1904, the new chemical lecture hall and laboratory and the two physical laboratories at the Technical College will be used by the students of the Medical College. A Professor of Chemistry is being obtained for the Medical College from England, and should arrive before October, 1904. During the year 11 new medical students, 4 apothecary students, and 1 casual student entered the College. There were 96 medical, 32 apothecary, and 1 casual student at the end of the year. The total fees amounted to Rs. 17,260·50, which is an increase of Rs. 1,347·35 upon the fees of 1902.

The Government at my suggestion allowed the expenses for a post-graduate course at the Medical College for a fortnight's duration in April, for officers of this Department stationed at a distance from Colombo, to familiarise themselves with some of the recent advances made in Medical and Surgical Science. Thirteen Medical Officers attended. It is hoped that this course will be followed by similar ones each year.

Civil Medical Stores.—Dr. Owen Johnson was in charge of this institution as Acting Medical Superintendent. Mr. A. D. Cotton is the Chief Storekeeper. The drugs, chemicals, and instruments received from England amounted to Rs. 178,473·81, from India Rs. 4,320·62. The cost of articles purchased from the Government Stores and the local market for the preparation of drugs in the Medical Stores came to Rs. 5,734·15, while the cost of repairing surgical instruments amounted to Rs. 50·50, and that of transport and postage to Rs. 3,943·22; extra service, petty expenses and contingencies to Rs. 685·54; the sale of medicines to Government Departments and others, Rs. 2,343·68; sale of medicines to planters, Rs. 1,683·15. The sale of unserviceable articles realised Rs. 90·62, and the value of the surgical instruments lost and paid for by the officers of the Department amounted to Rs. 192·28. The cost of quinine, fever powders, &c., issued to Government Agents and others free of cost was Rs. 2,984·67.

Strength of the Medical Department.—The strength of the Medical Department was as follows: 1 Principal Civil Medical Officer and Inspector-General of Hospitals, 1 Assistant Principal Civil Medical Officer, 1 Registrar of the Medical College, 1 Director, Bacteriological Institute, 7 Colonial Surgeons, 1 Superintendent of the Lunatic Asylum, 1 Surgeon in charge of the General Hospital at Colombo, 2 Medical women, 23 Assistant Colonial Surgeons, 27 Deputy Assistant Colonial Surgeons, 40 Sub-Assistant Colonial Surgeons, 15 Probationer Sub-Assistant Colonial Surgeons, 4 Health Officers, 245 Apothecaries, 1 Chief Medical Storekeeper, 1 Chief Inspector of Vaccination, 6 Inspectors of Vaccination, and 108 Vaccinators.

Estates Branch.

During the year 1903 there were 1,798 estates scheduled to 33 districts and 31 sub-districts, with 20 District Hospitals and 29 District Dispensaries and 13 Civil Hospitals and Dispensaries.

To attend to the medical wants of the above the following officers were employed: Deputy-Assistant Colonial Surgeons 15, Sub-Assistant Colonial Surgeons 10 (1 vacant), and Apothecaries 28.

During 1903 there were 9,158 estate labourers treated in the District Hospitals and Civil constituted District Hospitals, against 10,995 in 1902. Of these 1,812 died, a death-rate of 19·78 per cent. Of the mixed races 14,693 were treated, of whom 884 died, a death-rate of 6·01 per cent.

In the Civil Hospitals worked partly as District Hospitals the death-rate of estate labourers was 20·61 per cent., whilst in the District Hospitals it was 19·45 per cent. The highest death-rate (27·8 per cent.) among the estate labourers occurred in the District Hospital at Haputale, and the lowest (8·31 per cent.) in the Civil Hospital at Balapitiya. The admissions into the former were 241, into the latter 36. In the Civil Hospital, Mulkalkele, which was open only during the fever season, there were no deaths among estate labourers.

The total number of days the estate labourers stayed in hospital was 243,125, an average of twenty-six days. Of these, 169,056 were paid for by the estates, the rest being charged to the fund. The total number of days mixed races stayed in District Hospitals was 176,033, an average of twelve days.

The total number of estate labourers treated at the out-door dispensaries was 73,455. The total number of estate labourers treated on estates was 25,265.

The total number of births reported from estates was 11,637, of which 5,778 were males, 5,609 were females, and 250 were still-births.

The number of deaths reported from estates was 8,224, of whom 4,028 were males, 4,192 were females, and in 4 cases the sex was not stated.

The expenditure under the Medical Aid Ordinance amounted to Rs. 523,163·72, including exchange compensation, and receipts to Rs. 326,535·91, derived from the following sources: Export duty Rs. 140,022·09, hospital charges for treatment of coolies Rs. 54,784·90, recovered for visits paid to estates Rs. 20,660, sale of unserviceable and superfluous articles Rs. 205·62, medicines sold to superintendents of estates Rs. 1,745·99, medicines sold in bulk to superintendents of estates and prescriptions compounded Rs. 10,253·59, dispensary collections Rs. 2,273·82, cost of maintenance, medicine, and funeral expenses of other than estate labourers Rs. 92,680·87, recoveries for maintenance of others Rs. 3,909·03. The net expenditure was Rs. 196,627·81. One hundred and twenty-six dispensaries are now established in the planting districts. The gross expenditure was—

	Rs.	c.
Civil Branch	1,294,925	85
Estates Branch	523,163	72
Total ..	1,818,089	57

And the net expenditure was—

	Rs.	c.
Civil Branch	1,064,408	73
Estates Branch	196,627	81
Total ..	1,261,036	54

No. 4.—CYPRUS.

MEDICAL REPORT ON THE CYPRUS HOSPITALS AND DISPENSARIES, INCLUDING THE LUNATIC ASYLUM AND LEPER FARM.

By GEORGE A. WILLIAMSON, M.A., M.D.

This Report is purely Statistical.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	1	—	1
Anæmia	22	—	24
Beri-beri	—	—	—
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	—	—	—
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Debility	33	4	38
Delirium Tremens	—	—	—
Dengue	—	—	—
Diabetes Mellitus	—	—	—
Diabetes Insipidus	—	—	—
Diphtheria	1	1	1
Dysentery	22	2	22
Enteric Fever	38	9	45
Erysipelas	8	—	8
Febricula	2	—	2
Filariasis	—	—	—
Gonorrhœa	49	—	50
Gout	—	—	—
Hydrophobia	—	—	—
Influenza	115	1	116
Kala-Azar	—	—	—
Leprosy—			
(*a*) Nodular	9	9	60
(*b*) Anæsthetic	9	5	67
(*c*) Mixed	—	—	—
Malarial Fever—			
(*a*) Intermittent	—	—	—
Quotidian	53	—	54
Tertian	49	—	50
Quartan	19	—	19
Irregular	24	—	24
Type undiagnosed	18	1	19
(*b*) Remittent	68	1	69
(*c*) Pernicious	15	2	15
(*d*) Malarial Cachexia	—	—	—
Malta Fever	—	—	—
Measles	—	—	—
Mumps	10	—	10
New Growths—			
Non-malignant	5	—	5
Malignant	15	—	15
Old Age	—	—	—
Other Diseases	—	—	—
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	—	—	—
Rachitis	—	—	—
Rheumatic Fever	5	—	5
Rheumatism	33	—	34
Rheumatoid Arthritis	4	—	4
Scarlet Fever	—	—	—
Scurvy	—	—	—
Septicæmia	1	—	1
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox	—	—	—
Syphilis—			
(*a*) Primary	22	—	24
(*b*) Secondary	11	—	11
(*c*) Tertiary	—	—	—
(*d*) Congenital	2	—	3
Tetanus	1	—	1
Trypanosoma Fever	—	—	—
Tubercle—	—	—	—
(*a*) Phthisis Pulmonalis	—	—	—
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculous Disease of Bones	—	—	—
Other Tubercular Diseases	17	1	18
Varicella	—	—	—
Whooping Cough	—	—	—
Yaws	—	—	—
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	57	2	58
Circulatory System—			
(*a*) Valvular Disease of Heart	8	1	8
(*b*) Other Diseases	9	1	11
Digestive System—			
(*a*) Diarrhœa	16	1	17
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	4	1	4
Congestion of Liver	—	—	—
(*d*) Abscess of Liver	—	—	—
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	1	—	2
(*g*) Cirrhosis of Liver	4	1	4
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	124	7	136
Ear	4	—	4
Eye	128	—	140
Generative System—			
Male Organs	30	1	30
Female Organs	15	—	17
Lymphatic System	27	—	31
Nervous System	52	10	84
Nose	3	—	3
Organs of Locomotion	45	—	52
Respiratory System	264	25	275
Skin—	—	—	—
(*a*) Scabies	—	—	—
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	4	—	4
(*f*) Other Diseases	53	1	54
Urinary System	32	4	33
Injuries, General, Local—			
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	210	6	217
Parasites—			
Ascaris lumbricoides	5	—	6
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	—	—	—
Tape-worm	4	—	5
Poisons—			
Snake-bites	1	—	1
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	8	—	8
Surgical Operations—			
Amputations, Major	63	9	64
,, Minor	163	1	165
Other Operations	2	1	2
Eye	40	—	40
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

No. 5.—CYPRUS.

RETURN OF DISEASES IN 1903 FROM SIX DISTRICT DISPENSARIES AND EIGHT RURAL DIVISIONS.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	—	—	4
Anæmia	—	—	506
Anthrax	—	—	2
Beri-beri	—	—	—
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	—	—	—
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Debility	—	—	1249
Delirium Tremens	—	—	3
Dengue	—	—	—
Diabetes Mellitus	—	—	8
Diabetes Insipidus	—	—	3
Diphtheria	—	—	9
Dysentery	—	—	261
Enteric Fever	—	—	173
Erysipelas	—	—	87
Febricula	—	—	482
Filariasis	—	—	—
Gonorrhœa	—	—	366
Gout	—	—	13
Hydrophobia	—	—	—
Influenza	—	—	1776
Kala-Azar	—	—	—
Leprosy—			
(*a*) Nodular	—	—	11
(*b*) Anæsthetic	—	—	12
(*c*) Mixed	—	—	17
Malarial Fever—			
(*a*) Intermittent—			
Quotidian	—	—	1808
Tertian	—	—	720
Quartan	—	—	133
Irregular	—	—	129
Type undiagnosed	—	—	1774
(*b*) Remittent	—	—	1277
(*c*) Pernicious	—	—	38
(*d*) Malarial Cachexia	—	—	—
Malta Fever	—	—	—
Measles	—	—	1
Mumps	—	—	102
New Growths—			
Non-malignant	—	—	101
Malignant	—	—	49
Old Age	—	—	—
Other Diseases	—	—	25
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	—	—	1
Rachitis	—	—	—
Rheumatic Fever	—	—	68
Rheumatism	—	—	782
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	—	—	32
Septicæmia	—	—	25
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox	—	—	13
Syphilis—			
(*a*) Primary	—	—	303
(*b*) Secondary	—	—	139
(*c*) Tertiary	—	—	—
(*d*) Congenital	—	—	16
Tetanus	—	—	—
Trypanosoma Fever	—	—	—
Tubercle—	—	—	—
(*a*) Phthisis Pulmonalis	—	—	—
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculous Disease of Bones	—	—	—
Other Tubercular Diseases	—	—	179
Varicella	—	—	—
Whooping Cough	—	—	—
Yaws	—	—	—
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	—	—	501
Circulatory System	—	—	202
(*a*) Valvular Disease of Heart	—	—	—
(*b*) Other Diseases	—	—	—
Digestive System—	—	—	4136
(*a*) Diarrhœa	—	—	—
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	—	—	—
Congestion of Liver	—	—	—
(*d*) Abscess of Liver	—	—	—
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	—	—	—
(*g*) Cirrhosis of Liver	—	—	—
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	—	—	—
Ear	—	—	561
Eye	—	—	4486
Generative System—			
Male Organs	—	—	204
Female Organs	—	—	259
Lymphatic System	—	—	475
Nervous System	—	—	1321
Nose	—	—	158
Organs of Locomotion	—	—	208
Respiratory System	—	—	1856
Skin—	—	—	2526
(*a*) Scabies	—	—	—
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	—	—	—
(*f*) Other Diseases	—	—	—
Urinary System	—	—	210
Injuries, General, Local—			
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	—	—	1115
Parasites—	—	—	—
Ascaris lumbricoides	—	—	215
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	—	—	—
Tape-worm	—	—	—
Poisons—			
Snake-bites	—	—	—
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	—	—	16
Surgical Operations—			
Amputations, Major	—	—	—
,, Minor	—	—	—
Other Operations	—		257
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

No. 6.

FEDERATED MALAY STATES.

Medical Report on the State of Pahang for 1903.

By S. LUCY, State Surgeon, Pahang.

In-Patients.

(1) During the year 2,008 patients were treated in the wards of the various hospitals, as compared with 1,894 in the previous year. The admissions at the Bentong Hospital, which numbered 793 as against 421 in 1902, entirely account for the total increase of in-patients; at all other hospitals the numbers have fallen off, particularly is this the case at Raub and Kuala Lipis. The small number of patients seeking admission at these hospitals is attributable to the closing down or great reduction in the labour forces of the more important neighbouring mines, rather than to any betterment of the public health. At Bentong there has been much overcrowding, and the want of accommodation has caused some inconvenience and not a little suffering; numbers of patients were refused admission, and others have been discharged before they were fit to return to work in order to make room for grave cases demanding immediate attention. Increased ward space is being provided.

(2) The mean mortality amongst the in-patients was 11·05 per cent., as against 12·14 per cent. in 1902. The highest death-rate occurred at Bentong—viz., 15·48—but these figures compare very favourably with those of last year, when the death-rate was 25·70 per cent. The serious condition of large numbers of the patients admitted to this hospital may be deduced from the fact that no less than 43 patients died within forty-eight hours of admission. If these are excluded, as they fairly may be in computing the death-rate, the mortality at Bentong is reduced from 15·48 to 10·32. The mean death-rate for all hospitals, exclusive of cases dying within forty-eight hours of admission, was 7·91.

Out-Patients.

(3) Thirteen thousand eight hundred and forty-nine visits were made to the out-patient department during the year; these figures include 8,428 new cases and 5,421 repetitions, as against 7,620 new cases and 4,105 repetitions in 1902.

(4) The Malays are very ready to accept European medicaments and methods of treatment when these are brought to their doors; and, though shy of seeking admission or treatment at the station hospitals, they are eager enough to submit to examination, and will clamour for drugs when a visit is made to their kampongs. Severe forms of skin disease and bowel complaints due to intestinal parasites are very common, and cause much distress and permanent impairment of health to the native children. The majority of these complaints are very amenable to treatment, but it is at present impossible to bring this treatment within easy reach of the widely distributed Malay population of the State.

Prevalent Diseases.

(5) Malarial Fever.—This disease accounts for the greatest number of admissions to the wards; most of the cases are benign in type, and respond readily to treatment; the mortality occurs mainly amongst the chronic malarial cachexias. The intense forms of malignant infection are uncommon; 607 cases of malarial disease, with a mortality of 5·42, points to the conclusion that malaria is not by any means the most formidable of tropical diseases met with in Pahang, though the above figures do not convey a correct impression of the total damage to the general health caused by the malarial parasite, principally for two reasons—firstly, because Malays rarely come for treatment for this disease, they regard two or three attacks of malaria each year as a matter of course and unavoidable; and secondly, because repeated attacks of malaria are common and produce a cachexia which renders the subject particularly liable and non-resistant to any intercurrent disease to which he may fall a victim.

(6) At Lipis the police force has usually suffered somewhat severely from malaria, and during 1902 there were 116 admissions to hospital from the force from that disease. In July last a ration of 5 grains of quinine was given daily, and in August each man was, in addition, provided with a mosquito-net. From January 1st, 1903, to the date upon which the above-mentioned precautions were taken—viz., August 15th—there were 47 admissions for malaria, and from this date to December 31st, 18 only, or a total for the year of 65 as compared with 116 in the preceding year; the strength of the force in the Lipis command being practically the same for both years.

(7) Bowel Complaints.—Dysentery and diarrhœa produce, as usual, a heavy mortality—viz., 235 cases and 67 deaths, as against 241 cases and 57 deaths during 1902. The chronic forms of these diseases are very fatal and difficult of treatment; the native rarely has sufficient sense or power of self-denial to submit to the severe regimen in diet which is indicated in these cases.

(8) Beri-beri.—The case mortality from this complaint is very high, 157 cases and a mortality of 22·22 per cent., as compared with 144 cases and a mortality of 30·35 per cent. in 1902. Of the 35 fatal cases 21 occurred in the Bentong Hospital, which presents a case mortality of 31·81 per cent. from this disease. The cases occur almost entirely amongst the tin-mining population.

(9) PHTHISIS, with 48 cases and 20 deaths as compared with 26 cases and 12 deaths last year, would seem to be on the increase. It runs a rapid course in this moist climate, and, once acquired, a fatal termination can be predicted, with the very free ventilation that obtains, at any rate amongst the rural and mining population. I do not believe that any serious spread of the disease need be feared; it is, generally speaking, the opium-sodden Chinaman, who spends most of the day and night in a dark, hot, and ill-ventilated barrack, who contracts and rapidly succumbs to this disease.

INFECTIOUS DISEASES.

(10) No cases of grave infectious diseases were treated at any State hospital during the year; of the main infectious disorders, there were 8 cases of influenza, 1 chicken-pox, and 1 mumps.

(11) Early in the year small-pox appeared nearly simultaneously at the coast districts of Kuantan and Endau. The outbreak at Kuantan was quickly got under, and resulted in 23 cases and 2 deaths. The epidemic at Endau proved more troublesome, and the disease was not stamped out until September; it was of virulent type, and, of the 152 cases that came under treatment, 34 proved fatal.

VACCINATION.

(12) The total number of vaccinations performed during the year amounted to 2,231; of this number 502 were unsuccessful. The majority of these vaccinations were done in the Endau district during the small-pox epidemic, and include re-vaccinations and the inoculation of protected persons. The District Surgeon further accounts for a number of failures to a batch of badly-prepared lymph-tubes. As a rule, the Saigon lymph can be relied upon, and is far more efficient than the English prepared lymph.

An enactment providing for compulsory vaccination is under consideration, and, it is to be hoped, will soon become law. The subjoined table gives the number of vaccinations during the past six years:—

Year.	Vaccinations.
1898	1,364
1899	7,619
1900	3,588
1901	2,874
1902	2,499
1903	2,231

GENERAL.

(13) Through the courtesy of the managers of the mining companies and the medical officers or dressers in charge at Sungei Lembing, Blat and Penjum, I am able to publish the following figures relating to the hospitals or dispensaries at Sungei Lembing, Blat and Penjum:—

	Cases treated, in-patients.	Deaths.	Out-patients.
Pahang Corporation's Hospital at Sungei Lembing... ...	825	127	3,220

(14) At the Blat Mines a hospital was opened early in the year, and a dresser placed in charge. An average daily number of about 25 patients has been maintained.

(15) At the Penjum Dispensary 567 cases received treatment during the year.

(16) A Government hospital is again to be built at Kuantan. It will be commenced, and, it is hoped, completed, before the end of 1904. The mining population in the Blat and Lepar districts is increasing rapidly, large numbers of sinkehs are imported, and these suffer severely from fevers and beri-beri during the wet months of the north-east monsoon.

(17) An enactment to provide means for the prevention of the introduction and spread of contagious and infectious diseases became law in the latter end of the year.

SANITATION.

(18) The sanitary conditions of the townships have not materially altered during the year; some concrete drains have been put in at Raub, and a swamp at Lipis has been partially drained.

(19) The insanitary condition of Bentong village and of some more important works for its improvement has been the subject of a special report to Government.

(20) Raub is the only station at which there is a water supply not obviously liable to sewage contamination.

(21) At Kuala Lipis the European community is still dependent for water for all purposes on the Jelai and Lipis rivers, both of which are the public sewers of the native population.

Medical Report on the State of Negri Sembilan for 1903

By J. SHIPLEY PART, M.D.

Acting State Surgeon.

(1) There has generally been an increase of in-door patients and a decrease in out-door during the year—the total together showing 287 increase in both classes—the relative figures being for 1902, 11,899, and for 1903, 12,186.

(2) The year showed a decreased rainfall with several spells of drought. The diarrhœa and dysentery were about the same as in the previous year.

(3) The usual state of things was observed—namely, that diarrhœa and dysentery were worse in dry weather, tending to disappear on the occurrence of heavy rains.

(4) The diseases showing the largest numbers of admissions are as follows in order of occurrence, the highest being (1) beri-beri, (2) ulcers, (3) fever, (4) dysentery, (5) diarrhœa.

(5) The sanitary conditions are not ideal anywhere, since all excreta is disposed off in the soil, water supply being almost entirely from wells.

In Seremban the drainage system badly wants overhauling in places, but this takes time and is in hand.

(6) Something has been done during the year, but much remains in the way of filling up mining holes, borrow pits, &c., in the neighbourhood of the town. Holes continue to be made wherever roads are built on the flat, and they are not drained.

VACCINATION.

(7) There were 2,373, of which 874 were done in Johol, a sub-district of Kuala Pilah, a collection of kampongs about which more below.

It is exceedingly difficult to obtain proper protection in some districts owing to the ignorance and prejudice of the outlying-kampong Malay, although in other

places quite contiguous they fully appreciate its advantages.

SMALL-POX.

(8) There were four outbreaks of this disease in the State during the year—at Johol 270 cases, Ayer Kuning 49, Rembau 8, Seremban 1 case.

There is one point to which attention should be drawn, and that is an important one in discussing the Johol outbreak—namely, at the commencement in June, it was decided by the Medical Department to isolate cases and contacts, but this was not allowed by the Government, and the Medical Department was instructed to rely solely on vaccination. That this measure when completely carried out will prevent outbreaks is true, but when in a scattered jungle population there is widespread objection to it, this proper carrying out is next to impossible, as many of the people disappear when the vaccination officer appears on the scene. The people wander about from kampong to kampong and so variola is spread broadcast wherever a few cases occur; this cannot be stopped without isolation, and to do so efficiently requires proper buildings with staff.

(9) Diarrhœa and dysentery, the usual scourges of the country, among the Indian population at least, shows no increase, though 797 more in-patients were treated than last year, and this in spite of the large numbers of men imported by the Federated Malay States Railways.

This result I attribute to the greater care exercised in regard to their food supplies and housing, also to the greater promptitude with which they are brought under treatment The mortality in diarrhœa shows a mortality of 28 per cent. as against 42 per cent. for the previous year; dysentery 29 per cent. against 40 per cent. of 1902.

(10) Beri-beri shows an increase of cases (total 1,141) with a mortality of 7·09 per cent. as against 881 cases in 1902, mortality 9·1 per cent.

WORK OF THE DEPARTMENT GENERALLY.

(11) On September 5th the State Surgeon left on long leave, the District Surgeon acting for him, he being relieved by Dr. Milne, an assistant to the Institute for Pathological Research, Federated Malay States.

(12) Every effort was made by the Government during the year to obtain more assistant-surgeons, but without success, and the department is consequently undermanned as usual, there being five vacancies out of six appointments for assistant-surgeons.

(13) The remedy for this is hard to see. To remedy it promptly, the only thing to do appears to be to increase the inducements in the shape of pay, to begin with.

(14) In time it can be done by educating selected boys who should be picked for smartness from the whole F.M.S., and recommended by the school authorities, but if this is to have continued success the allowance $25 per mensem during their college course will have to be increased.

(15) One man sent to India was a married senior dresser of long service, able and trustworthy; he could, of course, not exist on the pittance given him and had to return.

(16) The European and second-class wards were opened in the middle of the year, and 15 patients treated there with one death.

(17) The one nurse we have has been a great boon, and I should like to see another appointed to provide for outside nursing and night work; this would encourage materially the willingness of officers and their families to go into hospital for treatment.

(18) The total number of in-patients treated shows an increase from 4,453 in previous year to 5,250.

(19) There were 29 operations done during the year, including a large proportion of major ones.

TOTAL CASE MORTALITY.

(20) For all hospitals, 7·8 per cent.; the highest being at Tampin and the lowest at Port Dickson. At the Seremban hospital, the gross mortality was 8·1 per cent. and the net (deducting those dying within forty-eight hours) 5·7 per cent.

NATIONALITIES.

(21) Of the in-patients 66 per cent. were Chinese, 23 per cent. were Tamils, 4 per cent. were Malays, 3 per cent. were Sikhs.

PARTICULAR HOSPITALS—SEREMBAN GENERAL AND PAUPER HOSPITALS.

(22) (Admissions 2,771, mortality 8·2 per cent.) An increase of 632 admissions and a decrease of mortality of nearly 50 per cent.

23. Mr. R. Van Geyzel acted as assistant-surgeon during the year.

SEREMBAN GAOL INFIRMARY.

(24) Sickness rate, 74 per mille against 55 last year; mortality of cases treated 5·3 per cent. against 10·8 last year. In all four prisoners died; one from diarrhœa, one dysentery, one pulmonary phthisis and one undiagnosed.

The District Surgeon and a dresser from the pauper hospital visited the infirmary daily.

BERI-BERI HOSPITAL, PORT DICKSON.

(25) (Admissions 263, mortality 4 per cent.) Admissions increased by 40, and a slight increase of mortality, which last year was 3·96 per cent.; 38 per cent. of the deaths in this hospital were from dysentery. Dresser in charge, A. P. Koek.

JELEBU HOSPITAL.

(26) (Admissions 688, mortality 7·9 per cent.) An increase of 105 admissions; and a decrease of mortality, which was 9·64 last year. Dresser in charge, T. Kanapathipillay.

KUALA PILAH HOSPITAL.

(27) (Admissions 626, mortality 8·8 per cent. There has again been a decrease of admissions to this hospital—97 less than last year; and an increase to the mortality, which was 4·83 in 1902. Mr. P. La Brooy acted as assistant-surgeon in charge of this hospital during this year.

TAMPIN HOSPITAL.

(28) (Admissions 492,mortality 9·7 per cent.) There has been an increase of admissions in this hospital by 73. The mortality remains about the same. Mr. H. G. Copcult, assistant-surgeon, was in charge during the year.

PORT DICKSON DISPENSARY.

(29) At this institution 510 cases, including re-visits, were attended to as out-patients against 466 in 1902; and 680 in 1901.

MALAY REPORTS.—*Continued.*

Appendix A.

Return of In-Patients, various Hospitals in Negri Sembilan, 1903.

Hospital.	Remained.	Admitted.	Total.	Discharged.	Transferred.	Absconded.	Died.	Remaining.	Percentage of deaths to total treated.	Percentage of deaths due to beri-beri.	Excluding those dying within 24 and 48 hours.	Percentage of deaths to total treated in 1902.
S'ban Pauper	160	2,771	2,931	2,401	16	49	241	224	8·2	7·7	5·8	16·02
,, General	—	15	15	13	—	—	1	1	6·6	..	—	—
,, Gaol	—	75	75	70	—	—	4	1	5·3	..	—	10·87
P. Dickson	62	263	325	244	3	5	13	60	4	1·9	—	3·96
Jelebu	41	688	729	600	4	6	58	61	7·9	7·7	—	9·64
K. Pilah	27	626	653	556	1	2	46	48	8·8	5·6	7·04	4·83
Tampin	30	492	522	438	1	—	51	32	9·7	30	—	10·78
Total	320	4,930	5,250	4,322	25	62	414	427	7·8	7·09	—	—
Previous year	320	4,133	4,453	3,533	9	84	527	320	11·83	9·1	—	—

Appendix B.

Showing Diseases more commonly Treated, with Mortality.

Disease.	Cases.	Deaths.	Proportion per 1,000. Of deaths to cases (case-mortality).	Of particular diseases to all diseases.	Of deaths from particular diseases to all deaths.
Anæmia	86	8	93	16	19
Beri-beri	1,141	81	71	217	196
Debility	167	21	126	32	51
Diarrhœa	188	53	282	36	128
Dysentery	407	120	295	78	290
Fevers	738	26	35	141	63
Ulcers	973	6	6	185	14
Other causes	1,550	99	64	295	239
Total	5,250	414	972	1,000	1,000

Appendix C.

Annual Return of Nationality for Negri Sembilan Hospitals for 1903.

Nationality.	Remained.	Admitted.	Total.	Discharged.	Transferred.	Absconded.	Died.	Remaining.	Number of beri-beri.	Number of deaths from beri-beri.	Number of beri-beri discharged and cured.	Percentage of deaths from beri-beri.	Percentage of deaths to total treated from all diseases.
Chinese	206	3,247	3,453	2,744	15	55	291	348	1,135	81	885	7·1	8·4
Tamils	95	1,115	1,210	1,035	6	5	104	58	1	—	1	—	8.5
Malays	12	239	251	233	4	2	8	4	4	—	4	—	3·1
Singhalese	—	47	47	47									
Sikhs	7	206	213	192	—	—	7	14	—	—	—	—	3·2
Bengalese	—	4	4	4									
Javanese	—	2	2	2									
Eurasians	—	4	4	4									
Europeans	—	10	10	9	—	—	1	—	—	—	—	—	10
Japanese	—	7	7	6	—	—	1	—	1	—	1	—	14·2
Other nations	—	49	49	44	—	—	2	3	—	—	—	—	4·07
Total	320	4,930	5,250	4,322	25	62	414	427	1,141	81	891	7·09	7·8

Appendix D.

Return of Out-door Patients treated from 1899 to 1903.

Dispensary.	Number of Visits. 1899.	1900.	1901.	1902.	1903.
Seremban	1,966	1,977	2,631	2,676	1,878
Port Dickson	455	782	680	446	510
Jelebu	623	793	656	1,766	1,308
Kuala Pilah	3,344	1,015	1,801	1,011	1,985
Tampin	1,804	1,922	1,734	1,547	1,255
Total ..	8,182	6,489	7,502	7,446	6,936

Appendix E.

Table showing actual number of Sick Convicts treated in the Prison Hospital during the years 1899, 1900, 1901, 1902 and 1903, case mortality, and sickness rate per thousand of strength.

Years.	Total prisoners during the year.	Total treated.	Total deaths.	Case mortality per 1,000.	Sickness rate per mille of prisoners.
1899	434	92	4	43	212
1900	922	59	3	50	64
1901	898	50	5	100	55
1902	831	46	5	108	55
1903	1,073	75	*4	53	74

*Diarrhœa	1 ..	1 month and 15 days' duration.
Dysentery	1 ..	3 days' ,,
Pulmonary Phthisis	1 ..	3 months' ,,
Undiagnosed	1 ..	1 month' ,,

Appendix F.

Number of Patients treated in the State Hospitals, 1897 to 1903.

Year.	Total treated.	Total deaths.	Percentage of deaths.	Remarks.
1897 ..	3,324	284	8·5	Excluding those dying within 24 and 48 hours.
1898 ..	3,128	189	6·4	
1899 ..	4,007	184	4·5	
1900 ..	5,016	316	6·3	
1901 ..	5,280	366	6·93	
1902 ..	4,453	529	11·8	All cases included.
1903 ..	5,250	414	7·8	,, ,,

Appendix G.

Number of Beri-beri cases treated in the State Hospitals.

Year.	Total treated.	Total deaths.	Percentage of deaths.
1897 ..	1,033	88	8·5
1898 ..	603	41	6·7
1899 ..	1,193	55	4·6
1900 ..	1,749	48	2·7
1901 ..	1,104	45	4·0
1902 ..	881	81	9·1
1903 ..	1,141	81	7·09

Appendix H.

Return of Vaccination for the year 1903.

Station.	Number vaccinated.	Result. Perfect.	Modified.	Failed.	Not seen.
Seremban	138	112	6	15	5
Kuala Pilah	874	623	10	76	165
Tampin	1,114	1,041	2	58	13
Jelebu	247	234	—	9	4
Total ..	2,373	2,010	18	158	187

No. 6.—FEDERATED MALAY STATES.

RETURN OF DISEASES AND DEATHS IN 1903 AT THE GENERAL HOSPITALS AND GAOL HOSPITALS AT KUALA LIPIS AND PEKAN, THE DISTRICT HOSPITALS AT RAUB AND BENTONG.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	38	1	38
Anæmia	31	3	40
Beri-beri	140	35	157
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	1	—	1
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Debility	33	5	35
Delirium Tremens	9	1	9
Dengue	—	—	—
Diabetes Mellitus	1	—	1
Diabetes Insipidus	23	11	25
Diphtheria	1	1	1
Dysentery	118	37	122
Enteric Fever	336	71	358
Erysipelas	2	1	2
Febricula	56	3	58
Filariasis	—	—	—
Gonorrhœa	15	—	16
Gout	—	—	—
Hydrophobia	7	2	7
Influenza	8	—	8
Kala-Azar	—	—	—
Leprosy	1	—	1
(*a*) Nodular	29	15	102
(*b*) Anæsthetic	55	32	178
(*c*) Mixed	104	45	246
Malarial Fever—			
(*a*) Intermittent	—	—	3
Quotidian	130	4	134
Tertian	34	1	39
Quartan	4	—	6
Irregular	2	—	2
Type undiagnosed	409	25	409
(*b*) Remittent	14	4	14
(*c*) Pernicious	—	—	—
(*d*) Malarial Cachexia	3215	576	3457
Malta Fever	—	—	—
Measles	20	—	20
Mumps	1	—	1
New Growths—			
Non-malignant	297	7	310
Malignant	256	33	263
Old Age	198	63	215
Other Diseases	1	1	1
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	24	13	26
Rachitis	—	—	—
Rheumatic Fever	5	—	5
Rheumatism	49	—	51
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	2	1	2
Septicæmia	48	22	48
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox	3	—	3
Syphilis—			
(*a*) Primary	8	—	9
(*b*) Secondary	22	—	23
(*c*) Tertiary	166	6	177
(*d*) Congenital	23	3	26
Tetanus	64	32	66
Trypanosoma Fever	—	—	—
Tubercle—			
(*a*) Phthis Pulmonalis	964	267	1004
(*b*) Tuberculosis of Glands	41	14	42
(*c*) Lupus	22	—	22
GENERAL DISEASES—*continued.*			
(*d*) Tabes Mesenterica	16	4	24
(*e*) Tubercular Diseases of Bones	5	1	6
Other Tubercular Diseases	7	3	7
Varicella	—	—	—
Whooping Cough	10	1	10
Yaws	1	—	1
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	57	3	60
Circulatory System—			
(*a*) Valvular Disease of Heart	13	3	13
(*b*) Other Diseases	1	1	1
Digestive System—			
(*a*) Diarrhœa	110	30	113
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	182	5	185
Congestion of Liver	—	—	—
(*d*) Abscess of Liver	34	16	35
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	79	11	83
(*g*) Cirrhosis of Liver	94	32	100
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	26	1	27
Ear	1	—	1
Eye	24	1	26
Generative System—			
Male Organs	970	5	1002
Female Organs	1708	44	1742
Lymphatic System	557	10	577
Nervous System	23	4	24
Nose	68	—	68
Organs of Locomotion	13	—	15
Respiratory System	114	29	117
Skin—			
(*a*) Scabies	7	—	7
(*b*) Ringworm	50	—	51
(*c*) Tinea Imbricata	1	—	1
(*d*) Favus	—	—	—
(*e*) Eczema	15	—	16
(*f*) Other Diseases	191	—	207
Urinary System	525	82	547
Injuries, General, Local—			
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	1	—	1
(*c*) Other Injuries	140	9	145
Parasites—			
Ascaris lumbricoides	1	—	1
Oxyuris vermicularis	1	—	1
Dochmius duodenalis, or Ankylostoma duodenalis	1662	272	1775
Filaria medinensis (Guinea-worm)	10	—	10
Tape-worm	—	—	—
Poisons—			
Snake-bites	10	1	11
Corrosive Acids	2	—	2
Metallic Poisons	8	—	8
Vegetable Alkaloids	21	2	21
Nature unknown	15	1	15
Other Poisons	4	—	4
Surgical Operations—			
Amputations, Major	536	30	552
„ Minor	4	—	4
Other Operations	178	—	183
Eye	—	—	—
(*a*) Cataract	68	—	73
(*b*) Iridectomy	19	—	20
(*c*) Other Eye Operations	57	—	63

Medical Report on the State of Selangor for the Year 1903.

By E. O. A. TRAVERS.

State Surgeon.

Population.

The estimated population of the State on December 31st, 1903, was 216,923. Two thousand two hundred and two births and six thousand six hundred and eighty-nine deaths were reported during the year.

The birth-rate calculated as for the population of the State at the end of the year was 10·151 per mille, and the death-rate 30·835 per mille.

Meteorological Condition of the Seasons.

The total rainfall registered at Kuala Lumpur was 89·89 in., as against 116·40 in. 1902.

As is usually the case, the heaviest rainfall occurred in the last three months of the year.

The month of July was an exceptionally dry one, only 0·20 in. having been recorded, as against an average for the last twenty-five years of 3·94 in.

The mean temperature was 80·1° F., as against 81° F. in 1902. The maximum temperature registered at Kuala Lumpur was 93° F. and the minimum 68° F.

Prevalence of Sickness and Relative Mortality in Different Seasons.

No special effect of season on the health of the inhabitants or on the relative mortality was noted.

Number of Patients Treated in the Various Hospitals and Infirmaries.

The number of patients treated, with deaths and death-rate during the last five years, is shown in the following table :—

Year.	No. treated.	Deaths.	Death-rate.
1899	12,371	1,437	11·61
1900	17,963	2,419	13·43
1901	21,351	2,797	13·10
1902	18,173	2,087	11·48
1903	14,425	1,872	12·97

There has been a reduction of 3,748 in the number of cases treated as in-patients as compared to the total for 1902. This is mainly due to the closing of the railway hospital at Kajang, where 1,822 patients were treated in 1902, the vastly improved health of the prisoners in the Pudoh Gaol, where only 295 cases were treated, as against 1,169 in 1902, and a reduction of 686 in the number of cases treated in the Ulu Selangor Hospitals.

The number of deaths occurring in all hospitals was 1,872, as against 2,087 in the previous year.

This is the lowest number of deaths in hospital since 1899, which is satisfactory in view of the steady increase in the population of the State.

The death-rate for all hospitals was 12·97 per cent., as against 11·48 per cent. in 1902.

Two hundred and forty-nine patients were admitted in a practically moribund condition and died within forty-eight hours of coming to hospital.

Most of these patients were brought in by their friends in order to avoid the expense and inconvenience of burial.

Prevailing Diseases.

The following diseases caused the greater amount of sickness and mortality :—

Disease	No. Treated		Deaths		Death-rate	
	1902	1903	1902	1903	1902	1903
Malarial fevers ..	2977	1980	174	153	5·84 %	7·72 %
Beri-beri	2673	1912	325	351	12·15 ,,	18·35 ,,
Diarrhœa.. ..	1515	1074	528	359	34·85 ,,	32·42 ,,
Dysentery ..	973	638	320	229	32·86 ,,	35·89 ,,
Pulmonary diseases	850	811	241	266	28·35 ,,	32·78 ,,

Bowel Complaints.

I am glad to be able to report a large reduction both in the number of cases treated and the number of deaths from this form of disease.

The figures for the last three years are as follows :—

Year.	Total treated.	Deaths.	Death-rate.
1901	3,826	1,143	29·8 per cent.
1902	2,488	848	34·0 ,,
1903	1,712	588	34·3 ,,

Improvements in water supply, drainage and general sanitation are, I consider, mainly responsible for the marked decrease in the number of cases of this group of diseases.

Malarial Fevers.

The returns relating to malaria also show very marked improvement.

Year.	Total treated.	Deaths.	Death-rate.
1901	5,445	322	5·9 per cent.
1902	2,977	174	5·8 ,,
1903	1,980	153	7·7 ,,

The great reduction in the number of cases of malaria occurring in the State may be attributed to a very great extent to the sanitary work carried out by Government at Klang and Port Swettenham.

There is little doubt but that in former years the Klang district acted as a distributing centre for malaria, persons suffering from the disease carrying it about the State, and through the agency of mosquitoes giving the disease to others, and often introducing it into districts where it previously seldom occurred.

That the decrease in malaria in the Klang district, which was the subject of special report to Government, has steadily continued, is well shown by the following figures.

Cases of Malaria with Number of Deaths from that Disease at District Hospital, Klang, during the Last Four Years.

Year.	Cases treated.	Deaths.	
1900	477	31	
1901	820	70	
1902	417	32	Sanitary work carried out at Klang and Port Swettenham.
1903	230	19	

The anti-malarial campaign which was carried out with such success at Klang and Port Swettenham in 1902 has been continued during the past year; the work taken in hand being more especially permanent

drainage. A large tract of mangrove swamp at Port Swettenham has now been converted into well-drained and flourishing pasture.

Beri-beri.

The number of cases of this disease treated during the year was 1,912, with 351 deaths, as against 2,673 with 325 deaths in the previous year, the percentage of deaths being 18.3 and 12·15 respectively. This marked difference is mainly due to the comparative absence of beri-beri from the Pudoh Gaol during the past year.

Deducting the numbers treated in the Pudoh Gaol the figures are as follows:—

Year.	Total cases.	Deaths.	Percentage of deaths.
1902	1,772	308	17·4
1903	1,867	349	18·9

Thus, excluding the returns from the Pudoh Gaol, there has been a slight increase of beri-beri with a corresponding increase in death-rate.

This was most marked at the District Hospital, Kuala Lumpur, where 901 cases were treated, with 192 deaths, as against 839 with 158 deaths in the previous year.

As in former years, the difference between the returns relating to beri-beri in purely mining districts as compared to those in mainly agricultural districts is well marked:—

	Total treated.	Deaths.	Percentage of deaths.	
Kajang	175	11	6·28	agricultural.
Klang	31	3	9·67	,,
Kuala Kubu	164	66	40·45	mining.
Sungei Besi	71	13	18·31	,,

The death-rate from beri-beri at Kuala Kubu is extraordinarily high, and is being carefully enquired into.

The comparative absence of beri-beri from the agricultural districts is, in my opinion, mainly due to the scattered nature of the population. This favours the theory that beri-beri is an infective disease, the coolies when crowded together in mining kongsis being much more liable to be attacked than the gardeners and agriculturists, who mostly live in small separate huts.

Pulmonary Disease.

The number of cases treated for diseases of the lungs was 811 with 266 deaths, as against 850 cases with 241 deaths in the year 1902. Of the 266 deaths 177 were due to phthisis.

The fact that the number of deaths due to disease of the lungs exceeded that caused by malarial fevers or dysentery shows how necessary it is that the question of overcrowding in the towns, with the accompanying evils of bad ventilation and deficient light in the houses, should receive the careful attention of Government.

The difficulty is likely to become a very serious one, and the subject of phthisis was discussed at the Medical Congress held in 1902, when certain recommendations were made to Government with a view to checking the spread of this disease.

Venereal Disease.

The number of cases of venereal disease treated in hospital was 847 with 16 deaths, as against 844 with seven deaths in 1902.

Zymotic Disease.

Plague.—A small outbreak of plague occurred at Kuala Kubu, causing about 15 deaths. Of these cases three were treated at the District Hospital, Kuala Kubu, and two at the District Hospital, Kuala Lumpur. All the cases proved fatal.

Small-pox.—One case of small-pox was removed from a ship calling at Port Swettenham and was treated at the Quarantine Station.

Cholera.—A few cases of cholera occurred at Rawang in the mining kongsi; none of the cases were admitted to hospital.

Vaccination.

Most districts in the State were visited by the vaccinator during the year.

The number of persons vaccinated during the last three years were as follows:—

Year.	Number vaccinated.	Successful.	Failed.	Not seen.	Per-centage.
1901	2,297	2,074	24	199	89·89
1902	2,774	2,748	20	6	99·09
1903	3,236	3,176	18	42	98·14

Saigon buffalo lymph was used in all cases and was satisfactory in every way.

Infants of all nationalities are readily brought to the various centres appointed, and the advantages of vaccination are more thoroughly appreciated in Selangor than in England. The necessity for re-vaccination is, however, not understood, and although the infant population is now well protected, it is quite possible that large numbers of adults might be attacked under circumstances favouring the spread of the disease. Although not willing to be revaccinated under ordinary circumstances, I find that no objection to revaccination is raised by adults of all nationalities should a few cases of small-pox occur in their immediate neighbourhood.

Out-patients.

The number of persons applying for treatment as out-patients at the various hospitals and infirmaries was 36,174, as against 38,476 in 1902.

The District Hospital, Kuala Lumpur.

This hospital was throughout the year under the care of District Surgeon Dr. A. J. McClosky, who reports as follows:—

"*Admissions.* — Four thousand and forty-eight patients were admitted during the year, which, with 282 remaining from the previous year, gives a total treated of 4,330. The admissions exceeded those of last year by 16, while the total treated was less by 48.

"The following table shows the total treated for each of the last five years:—

Year.	Total treated.	Year.	Total treated.
1899	3,584	1902	4,378
1900	3,033	1903	4,330
1901	5,086		

"The following diseases caused the largest number of admissions, viz.: Beri-beri 801, ulcers 575, rheumatism 436, malarial fever 245, dysentery 243, diarrhœa 156, phthisis 142.

"The condition of many of those admitted was, as in previous years, very unsatisfactory, many cases being hopeless from the very beginning.

"The daily average number of sick was 288·62, a considerably lower figure than last year, which was 336·31.

"*Mortality.*—Seven hundred and twenty deaths occurred during the year, representing a mortality of 16·62 per cent., against 736 deaths and a mortality of 16·77 per cent. last year; 97 deaths occurred within 48 hours of admission.

"The following diseases caused the largest number of deaths :—

	1903		1902	
	No. of Deaths	Per-centage	No. of Deaths	Per-centage
Beri-beri	192	21·30	158	18·84
Dysentery	109	44·85	129	51·08
Phthisis	100	66·22	103	66·02
Diarrhœa	77	48·42	142	46·25
Cirrhosis of Liver	32	60·37	21	63·62

"*Special Diseases: Beri-beri.*—The admissions from this disease exceed those of last year by 40, and the death-rate is also slightly higher.

"The following table shows the admissions and death-rate for the last five years :—

Year.	Admissions.	Death-rate.
1899	720 ...	21·11 per cent.
1900	836 ...	20·91 ,,
1901	599 ...	21·55 ,,
1902	761 ...	18·84 ,,
1903	801 ...	21·30 ,,

"Forty-three patients were transferred to Jeram during the year.

"*Dysentery.*—The return shows 243 cases treated, 109 deaths and a death-rate of 44·85 per cent. Three of the deaths were complicated with abscess of liver, in two of which there were multiple abscesses. In all three amœbæ were demonstrated.

"*Diarrhœa.*—One hundred and fifty-nine cases were treated with 77 deaths and a death-rate of 48·42 per cent. The number of cases treated is considerably less than last year, when 307 cases were treated.

"*Malarial Fever.*—Two hundred and fifty-three cases were treated; this is an excess of 74 over last year. The types were :—

	1903.	1902.
Malignant	136 ...	81
Benign quartan	79 ...	55
Benign tertian	26 ...	43
Mixed types	12 ...	—
Total ...	253 ...	179

"The mixed types were :—

Malignant and benign tertian	6
Malignant and benign quartan	1
Benign tertian and quartan	5
Total ...	12

"Sixteen deaths were directly attributed to this disease, giving a death-rate of 6·32 per cent. All the deaths were from the malignant type. The districts from which most of the cases came were Kuala Lumpur (chiefly Batu Road and Java Street) 55, Gombak 45, Ampang 28, Kepong 12, Panthai 10.

"*Phthisis.*—The return shows 151 cases treated, with 100 deaths, but this disease complicated five other diseases, and was their immediate cause of death. The percentage of deaths, therefore, is 67·3. Several of the cases involved the bowel as well as the lungs.

"*Enteric Fever.*—Ten cases were treated, with eight deaths. Two of the patients died within 48 hours. Most of the cases proved fatal from perforation and peritonitis. One case was convalescent, when he ate some guavas and got a relapse with perforation and peritonitis. This is a form of accident which it is extremely difficult to prevent.

"*Plague.*—Two cases were admitted during the year. One was of the bubonic type and was transferred to the infectious ward, where he subsequently died. This case was treated with 5 grs. carbolic acid thrice daily. The other case was admitted with very high temperature and died the next day. No clinical signs were found to account for the high temperature, and the blood examination for malaria was negative. At the autopsy the only morbid appearance found was a number of small pin-point abscesses scattered throughout the spleen. Culture was made from the spleen, and the *Bacillus pestis* demonstrated. This was evidently the septicæmic type; there were no buboes.

"*Post-mortem Examinations.*—Two hundred and eight were performed at the District Hospital and 138 at the Institute for Medical Research by the Director and his staff.

"*Out-door Patients.*—Three thousand and twenty-seven were treated, consisting of 2,329 new cases and 698 repetitions. This is a total increase of 478 and an increase of 558 of new cases as compared with last year.

"*Vagrant Ward.*—Thirty-five cases were treated in this ward, with nine deaths and a death-rate of 25·71 per cent.

"I cannot conclude this report without expressing my thanks to the Director, Institute for Medical Research, and his staff for their valuable assistance in making *post-mortem*, bacteriological and blood examinations, &c."

The Leper Asylum.

Dr. A. J. McClosky, District Surgeon, in charge of this institution, reports as follows :—

"One hundred and twelve lepers were admitted, against 107 last year, and the total treated was 240, against 232 last year.

"Of the admissions, six were Tamils, one Malay and the rest Chinese. Forty-three absconded and 70 died.

"The mortality was 29·16 per cent. Several of the old inmates died during the year.

"The following table shows the comparative figures for the last three years :—

	Admitted.	Total treated.	Absconded.	Died.	Mortality.
1901	95	230	70	34	14·78 per cent.
1902	107	232	49	54	23·27 ,,
1903	112	240	43	70	29·16 ,,

"The increase in the admissions is not a standard to go by in judging of the prevalence of the disease, as several were readmissions of absconded lepers. This year I propose to note the new admissions and re-admissions.

"Discipline was well maintained during the year.

"The swamps to the south and east of the hospital were filled in. Quarters for four gardeners were erected outside the hospital compound."

The Pudoh Gaol.

The infirmary at the Pudoh Gaol was throughout the year under the care of the State Surgeon.

The average number of prisoners in the gaol was 448. I am glad to be able to report that throughout the year the prisoners enjoyed excellent health.

The total number of prisoners treated in the infirmary was 295, with a death-rate of 2·37 per cent., as against 1,169 with a death-rate of 2·56 in the previous year.

I attribute the good health of the prisoners partly to the improvement in the ventilation of the gaol, and partly to the arrangement by which the greater number of the prisoners were employed at extramural work.

Beri-beri.—For the first time for eight years the prisoners have been practically free from beri-beri, Fifteen cases remained under treatment on January 1st, and during that month 22 cases were admitted. Of these 14 were relapses and eight fresh cases: of the eight fresh cases only three had no previous history of beri-beri.

During the rest of the year only nine cases were admitted, and of these only two had no previous history of beri-beri and probably originated in the gaol.

Two prisoners died from beri-beri during the year. The following table gives the number of cases of beri-beri admitted to the infirmary each month during the years 1902 and 1903.

Month.	1902.	1903.	
January ...	68	22	
February ...	44	*nil*	
March ...	63	,,	
April	80	,,	
May	91	,,	
June	83	,,	
July	67	,,	
August ...	75	,,	
September ...	131	1	
October ...	9	2	(one awaiting trial)
November ...	35	5	(four relapses, one awaiting trial)
December ...	55	1	(a very doubtful case).

The want of regular hard labour, such as stone-breaking, was severely felt throughout the year.

The General Hospital, Kuala Lumpur.

This hospital has at different periods during the year been under the care of District Surgeons Dr. Gerrard, Dr. Davies, and recently of Dr. Fletcher, who reports as follows upon the year's work:—

"The number of patients treated during the year 1903 was slightly larger than for the year 1902, the numbers being—

1902 ... 2,170 | 1903 ... 2,244

"The number of deaths was small (106), the percentage of deaths to the total number of patients treated being 4·72 for both sexes taken together, and only 2·99 for men. Twenty-five patients were admitted to the European Ward during the year as against 35 in 1902.

"The old ward was vacated at the end of the year, and the new European hospital has now been opened.

"The number of patients treated in the Female Ward was 339, with 49 deaths. The percentage of deaths in this ward was therefore 14·45, whereas for the rest of the hospital it was only 2·99.

"Most of the patients admitted to this ward are either paupers, estate coolies, or prostitutes, and are generally so ill before they seek admission that little can be done for them.

"Dysentery (including diarrhœa) and phthisis were responsible for 19 of the 49 deaths.

"At present one-third of the women in hospital are suffering from phthisis in an advanced stage.

"An extension of this ward is to be built during the current year for women of the better class. This should prove of great service, as there is at present no provision for the hospital treatment of women whose husbands are in the position of junior Government clerks, &c., and do not care for them to go into a ward where a considerale proportion of the patients are prostitutes.

"*Malay States Guides.*—During the year 1903, 235 Malay States Guides were treated in hospital, with no deaths. In 1902, 220 cases were treated, with one death. These figures speak well for the health of the two companies quartered in Kuala Lumpur. The principal diseases for which they were admitted to hospital were malaria (60) and injuries (45).

"*Police.*—The admissions into the Police Ward were 567, with two deaths (from dysentery and diarrhœa). In 1902, there were 587 admissions, with three deaths. The number of admissions is large, but that the diseases from which these patients suffered were generally not of a serious nature is shown by the small death-rate of 0·35 per cent. One hundred and thirty-five of the admissions were for malaria, 44 for constipation and 16 for dyspepsia."

The New European Hospital.

This institution, with nurses' quarters and house for surgeon, was completed during the year. The hospital is an excellent one and is well equipped with every convenience for the comfort of patients. No expense has been spared in furnishing the wards and operating theatre in accordance with the most recent improvements. The hospital is, however, some two miles from the town, and being on a steep hill is difficult of approach. I fear that little use will be made of this institution by the public until it is in charge of a resident surgeon, and until some kind of suitable ambulance is provided by Government to convey patients to it.

The Lunatic Asylum.

The number of lunatics treated in asylum during the year was 180. There were 122 admissions; 75 were discharged cured or to care of friends, and 52 died. The death-rate was 28·88 per cent., as against 21 per cent. in 1902. Of the 52 deaths, 31 were due to dysentery and 10 to beri-beri.

There is no separate infirmary in the asylum for the accommodation of sick lunatics, who have to be treated in a long, low, ill-ventilated room, the ground floor of one of the blocks formerly used as prison cells, the association ward for healthy lunatics being on the upper floor.

As mentioned in my report for 1902, I am of opinion that the present lunatic asylum is in no way suitable for the intelligent treatment of persons of unsound mind. Criminals, cases of idiotcy and maniacs have to be kept together in one room. The wards are low, dark and badly ventilated, and there is no separate accommodation for women or facility for employing or amusing the patients.

Coast Hospitals.

The District Hospitals at Klang, Jugra and Kuala Selangor and the Beri-beri Hospital at Jeram have throughout the year been under the care of District Surgeon Dr. Watson, who reports as follows on the work done at each hospital :—

"*District Hospital, Klang.* — There has been a decrease in the number of patients admitted to hospital, and an increase in those treated as out-patients.

Year	In-door			Out-door	Out and In-door
	Total treated	Deaths	Mortality	Total treated	Percentage of malaria
1901 ..	1822	232	12·73	2789	38·8
1902 ..	1406	153	10·88	2389	20·48
1903 ..	1218	124	10·18	2688	12·11

"The mortality, after deducting deaths of 18 persons dying within 48 hours of admission, was 8·7 per cent. against 7·46 per cent. in 1902, and 8·61 per cent. in 1901.

"*Prevalent Diseases.*—The following table shows the more prevalent diseases :—

Disease.	No. treated.	No. of deaths.	Mortality.
Dysentery and diarrhœa	118	39	33·00 per cent.
Malaria	230	19	8·26 ,,
Pneumonia	35	13	34·28 ,,
Phthisis	17	7	41·17 ,,
Ulcer	193	1	0·05 ,,
Beri-beri	38	3	8·67 ,,

"Bowel complaints as usual head the list of deaths, even although there has been a decrease from 56 in 1902 to 39 in 1903.

"It is extremely satisfactory to note that along with the great decrease in the amount of malaria the number of cases of other diseases treated has only increased very slightly, the population having rapidly increased.

Year	In-door admissions		Out-door total treated	
	Fever	Other diseases	Fever	Other diseases
1901 ..	807	962	965	1824
1902 ..	403	953	364	2025
1903 ..	219	925	245	2443

"In the towns of Klang and Port Swettenham malaria has been reduced to an almost negligible factor, a saving of at least 800 lives having been effected in the last two years.

"*Infectious Diseases.*—Two cases of small-pox were treated, one from a steamer and one on an estate, but in neither instance did any spread of infection occur.

There has been no cholera. Two cases of typhoid fever were admitted towards the end of the year.

"*District Hospital, Jugra.*—The number of patients treated is shown in the following table :—

Year	In-door			Out-door	In-door and Out-door	
	Total Treated	Deaths	Mortality	Total Treated	Number	Percentage o Malaria
1901 ..	434	46	10·46	1204	915	55·8
1902 ..	267	21	7·63	567	279	33·4
1903 ..	209	12	5·82	1066	328	26·09

"The improvement in the health of Jugra begun in 1902 is most encouraging. During 1902 a little draining was done, and this year several most obnoxious pools in the vicinity of the hospital and the District Officer's and boatmen's quarters were drained, while a considerable amount of jungle was cleared away. During the two years quinine has been regularly distributed to school children and coolies.

"The Public Works Department lines at the 17¼ mile have been removed to a more healthy site on the Klanang road.

"To these measures I think we must attribute the improved health of Jugra; and, judging from the ease with which malaria has been dealt with in Klang and Port Swettenham, there is every encouragement to proceed with the work at Jugra.

"*District Hospital, Kuala Selangor.*—The work done during the year is shown in the following table :—

Year	In-door		Out-door
	Total Treated	Mortality	Total Treated
1901	221	3·16	1317
1902	158	8·22	1770
1903	168	4·16	1314

"The large number of out-door patients compared with number of in-door is due to the district being a Malay one. Although the Malays, as shown by the number who attend as out-patients, have faith in European medicines, it is a matter for regret that the conditions within the hospital have not yet been made such as to attract them as in-patients. They are thereby unable to avail themselves of the most valuable part of European treatment.

Medical Report on the State of Selangor for the Year 1903.

By E. O. A. TRAVERS.

State Surgeon.

"*Beri-beri Hospital, Jeram.*—This is the third complete year of this hospital's existence, and, as I pointed out, it acts as a district hospital for Jeram as well as a beri-beri hospital. The room taken up by the other diseases should not be grudged, as it keeps the dresser in more active touch with his work than if he had simply to attend convalescent beri-beri cases. The number treated was as follows :—

	1901.	1902.	1903.
Beri-beri	138	112	114
Malaria	27	31	29
Other diseases	46	49	52
Total death-rate	15·11	10·41	9·23
Beri-beri total death-rate	21·69	12·50	10·52

"It is satisfactory to note the still further decrease in the death-rate of the beri-beri patients. It will further decrease, I hope, as the compound is better drained.

"The number of beri-beri who contracted malaria was less than it hitherto has been, and I had hoped that by locking up the patients at night this number would have been still further reduced. Unfortunately, towards the end of the year, a large part of the mosquito-proof gauze was damaged by the wind.

"The compound has been still further improved, and the drainage would now be quite satisfactory could the outlet drain be kept open. This, however, appears to be impossible, and a new scheme for drainage is under consideration.

"Again I have pleasure in recording an improvement in the health of this district as a whole, the percentage of malaria treated at the hospitals having fallen from 23 per cent. in 1902 to 14·1 per cent. in 1903. This great improvement has been brought about by the drainage of the inhabited parts of the district, of which not the least important work was the Jeram drainage scheme.

"A very large area has been drained and shares in the improvement, which is extremely satisfactory and encouraging."

Ulu Selangor Hospitals.

The district hospitals at Kuala Kubu, Rawang and Serendah have throughout the year been under the care of District Surgeon Dr. Delmege, who reports as follows on the work done during the year :—

"The total number of cases treated was as follows :—

	In-patients.	Death-rate.	Out-patients.
District Hospital, Kuala Kubu	1,927	20·4	6,069
,, ,, Serendah ...	1,080	11·6	3,831
,, ,, Rawang ...	930	10·09	2,226
Dispensary			4,865

"There has been an increase in mortality at Kuala Kubu and Serandah, and a decrease at Rawang."

The very high death-rate among patients at the Kuala Kubu Hospital calls for special mention. It will be seen that it is almost double that for the other two hospitals in the district. The diseases causing the largest number of deaths were :—

	Cases.	Death-rate.
Diarrhœa ...	293	... 42·66 per cent.
Dysentery ...	89	... 65·16 ,,
Beri-beri ...	164	... 40·45 ,,

The death-rate among cases of beri-beri treated in the other two hospitals in the same district was 9·25 per cent. at Serendah and 7·52 per cent. at Rawang.

It is difficult to account for the extraordinary difference in the mortality at these three hospitals. The patients are drawn from a mining population in each case, and the hospital accommodation and equipment at Kuala Kubu is superior to that at Serendah and Rawang.

During the present year every effort will be made to reduce the death-rate, and it is hoped that an appeal to the mining community will result in the admission of the miners at an early stage of disease, when there will be a reasonable hope of their recovery.

District Hospital, Kajang.

This hospital has throughout the year been under the care of Apothecary Ngai Leung. The work done at this hospital was as follows :—

Year.	Total treated.	Deaths.	Death-rate.
1902 ...	1,223 ...	87 ...	7·11 per cent.
1903 ...	1,105 ...	90 ...	8·14 ,,

One hundred and seventy-five cases of beri-beri were treated, with 11 deaths, giving a percentage of 6·28.

Veterinary Department.

Mr. T. A. Ford, Veterinary Surgeon, reports as follows upon the work done during the year :—

"The following outbreaks of epidemic disease occurred during the year :—

"*Rinderpest.* — At eighth mile Cheras road and twelfth mile Langat road seven bullocks and seven buffaloes died ; I could not trace the origin of this outbreak. The disease did not spread to any extent, only the immediate in-contact animals being attacked. The outbreak was generally of a subacute type, most of the animals living for four or five days, and in some cases longer. Strict isolation of all animals, with closing of the roads at seventh and tenth mile Cheras and fourteenth mile Ulu Langat roads from August 29th for five weeks was found sufficient to prevent any spread of the epidemic.

"At the cattle quarantine station, Port Swettenham, an outbreak occurred on November 11th, when a buffalo recently landed from Penang died suddenly, and was found on *post-mortem* examination to have died of rinderpest.

"The disease spread very rapidly among the cargo of thirty buffaloes and from them to the bullocks in other sheds, and was the cause of twenty-seven deaths. Eight buffaloes were shot in the early part of the epidemic, with the hope of stamping out the outbreak. On November 22nd the disease had spread amongst the bullocks, and the infection was so

general I deemed it useless to destroy any more sick beasts, with the result that ten bullocks and three buffaloes recovered, and were released on December 20th.

"A number of *post-mortem* examinations were made in conjunction with Dr. Daniels, Director, I.M.R.

"On the question of the treatment of rinderpest, I may mention that acute cases succumb so rapidly there is no time to do anything; but in the subacute cases, after consultation with Dr. Daniels, who suggested magnesia sulphate (Epsom salts), I decided to take two cases which were passing watery stools, mixed with a good deal of blood, and sloughing mucous membrane.

"The doses given were about 2 ozs. in half a pint of water four times a day. The effect was to stop the straining and bleeding, and I think the animals looked brighter and more inclined for food; some other cases in which this drug was given without my knowledge, until they were released, also did well. This is not a specific, but appeared to guide the disease through one of its stages, by rendering the stools more watery and capable of being passed with less straining.

"*Foot-and-Mouth Disease.*—With the exception of the months of June, July and December, this disease has prevailed during the whole year, small, more or less isolated, outbreaks occurring all over the State. The total number of animals attacked was 354, and the most in any one month was 124 in September, Compared with 1902, these numbers are very small. and the improvement is, I think, due to the greater vigilance shown in isolating animals and the much drier weather.

"*Rabies.*—Four cases of this disease were met with during the year, in June and July; one a case of furious rabies which bit two people, another was a case of the dumb form of the disease. The other two dogs both showed obscure symptoms of being ill, but nothing in any way diagnostic. Rabbits inoculated with brain matter from these four cases all died, after a longer or shorter period of incubation, of paralytic rabies, the usual form for this disease to take in the rabbit. I would also remark that, so far as I am aware, although several dogs were bitten, in no case had rabies developed in any of the bitten animals, and I have carefully watched three dogs, undoubtedly bitten by subsequently proved to be rabid animals, which up to the time of writing have remained perfectly healthy.

"*Surra.*—One case of this disease was found in an Australian horse belonging to H.H. the Sultan of Selangor, and the parasite *(Trypanosoma wansi)* demonstrated to Dr. Daniels, who saw the case with me. Rats and guinea-pigs inoculated at the Institute of Medical Research with the blood from this horse died, and the parasites were found in abundance in the blood of the guinea-pigs. I have not heard that this disease has been met with in the F.M.S. before, and made it the subject of a special report to Government.

"*Prosecutions.*—During 1903 the following prosecutions were conducted: For adulterating pork with water, four at Kuala Kubu; fines from 50 dollars to 100 dollars were imposed. For insanitary sheds, 13; fines from 8 dollars to 50 dollars. For removing diseased and in-contact animals, 5; fines from 50 dollars to 200 dollars. For not reporting contagious diseases, 6; fines from 15 dollars to 50 dollars. For allowing cattle to stray contrary to *Gazette* notification, 4; fines from 10 dollars to 25 dollars. For cruelty to a bullock by burning his eyelids, 1; fined 50 dollars. For not registering as a cowkeeper, 1; fined 50 dollars.

"*Milk Licences.*—Sixty-seven licences were certified for during 1903, representing buffalo cows 113, calves 71, cows 266, calves 252, owned in Kuala Lumpur for milking purposes, a total of 702 animals. All the cowsheds are floored with cement or good bricks before a certificate of fitness to keep the animals is granted, and I find I now have little difficulty in getting the owners to keep their pens clean and sanitary."

Examination of Petroleum at Port Swettenham.

The testing of petroleum was carried out by the Deputy Health Officer at Port Swettenham under the superintendence of Dr. Watson.

The total petroleum imported was 1,102,392 gallons. No petroleum was rejected as unsafe.

Six thousand five hundred and fifty-two gallons of gasoline were also imported.

The number of samples of petroleum tested was 41, and the revenue collected was $565.

The following returns are attached:—

(*a*) Return of patients treated in all hospitals during the year 1903;

(*b*) Return of diseases more commonly treated with percentage of deaths during 1902 and 1903;

(*c*) Number of beri-beri cases treated in State hospitals from 1883 to 1903;

(*d*) Return of sick convicts treated in the gaol from 1883 to 1903;

(*e*) Vaccination return for the State for the year 1903;

(*f*) Return of small-pox treated in the State during the year 1903;

(*g*) Comparative return of out-door patients treated from 1894 to 1903;

(*h*) Number of police admitted into the General Hospital from 1901 to 1903.

No. 6.—FEDERATED MALAY STATES.

RETURN OF DISEASES AND DEATHS IN 1903 AT ALL HOSPITALS IN SELANGOR.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	8	1	8
Anæmia	333	64	359
Anthrax	—	—	—
Beri-beri	1662	351	1912
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	4	—	4
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Debility	241	23	255
Delirium Tremens	1	—	1
Dengue	39	—	39
Diabetes Mellitus	1	—	1
Diabetes Insipidus	—	—	—
Diphtheria	1	1	1
Dysentery	621	229	638
Enteric Fever	23	15	24
Erysipelas	7	1	7
Febricula	1	—	1
Filariasis	—	—	—
Gonorrhœa	304	1	322
Gout	—	—	—
Hydrophobia	—	—	—
Influenza	1	—	5
Kala-Azar	—	—	—
Leprosy	150	73	279
(*a*) Nodular	9	9	60
(*b*) Anæsthetic	9	5	67
(*c*) Mixed	—	—	—
Malarial Fever—			
(*a*) Intermittent—			
Quotidian	53	—	54
Tertian	95	4	99
Quartan	110	2	118
Irregular	265	35	470
Type undiagnosed	1104	17	1134
(*b*) Remittent	13	12	13
(*c*) Pernicious	28	17	30
(*d*) Malarial Cachexia	266	51	292
Malta Fever	—	—	—
Measles	2	—	2
Mumps	7	—	7
New Growths—			
Non-malignant	22	—	22
Malignant	10	7	10
Old Age	—	—	—
Other Diseases	30	8	32
Pellagra	—	—	—
Plague	6	5	6
Pyæmia	1	1	1
Rachitis	—	—	—
Rheumatic Fever	5	—	5
Rheumatism	838	4	917
Rheumatoid Arthritis	4	—	4
Scarlet Fever	—	—	—
Scurvy	—	—	—
Septicæmia	3	3	3
Sleeping Sickness	—	—	—
Sloughing Phagedæna	79	11	81
Small-pox	1	—	1
Syphilis—			
(*a*) Primary	155	—	166
(*b*) Secondary	113	1	121
(*c*) Tertiary	210	14	238
(*d*) Congenital	2	—	3
Tetanus	2	1	2
Trypanosoma Fever	—	—	—
Tubercle—	—	—	—
(*a*) Phthisis Pulmonalis	—	—	—
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculous Disease of Bones	—	—	—
Other Tubercular Diseases	21	5	24
Varicella	—	—	—
Whooping Cough	—	—	—
Yaws	1	—	1
Yellow Fever	—	—	—

LOCAL DISEASES.

Diseases of the—			
Cellular Tissue	271	10	286
Circulatory System—			
(*a*) Valvular Disease of Heart	43	17	45
(*b*) Other Diseases	9	1	11
Digestive System—			
(*a*) Diarrhœa	1034	359	1074
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	3	—	3
Congestion of Liver	1	—	1
(*d*) Abscess of Liver	6	5	8
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	19	3	19
(*g*) Cirrhosis of Liver	61	39	67
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	3	—	3
(*j*) Other Diseases	143	22	150
Ear	27	—	27
Eye	183	19	236
Generative System—			
Male Organs	223	1	293
Female Organs	36	1	41
Lymphatic System	69	2	71
Nervous System	273	83	355
Nose	12	—	12
Organs of Locomotion	122	14	129
Respiratory System	764	266	806
Skin—	—	—	—
(*a*) Scabies	—	—	—
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	75	—	77
(*f*) Other Diseases	1870	7	1994
Urinary System	100	26	110
Injuries, General, Local—			
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	1	1	1
(*c*) Other Injuries	1144	42	1205
Parasites—			
Ascaris lumbricoides	6	—	7
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	12	3	12
Dracunculus medinensis (Guinea-worm)	2	1	2
Tape-worm	4	—	5
Poisons—			
Snake-bites	16	3	17
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	8	—	8
Surgical Operations—			
Amputations, Major	63	9	64
,, Minor	163	1	165
Other Operations	2	1	2
Eye	40	—	40
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

No. 7.—FIJI.

MEDICAL REPORT FOR 1903.

By B. GLANVILLE CORNEY, Chief Medical Officer, Fiji.

Population.

(1) The estimated population of the colony at the end of the year amounted to 121,074 persons, and was made up of the following classes in the proportion shown :—

	Males	Females	Total
Europeans and other Whites ..	1,580	1,011	2,591
Aboriginal Fijians	48,522	42,381	90,903
East Indian Immigrants (including their children born in Fiji)	14,233	7,268	21,501
Melanesian and Malayo-Polynesian Immigrants	1,617	350	1,967
Rotumans	1,034	1,041	2,075
Half-castes and other degrees..	800	777	1,577
All others..	250	210	460
Total	68,036	53,038	121,074

These figures represent a decrease of 851 from the foregoing year's estimated population, caused mainly by an increased mortality among the aboriginal Fijians, the natives having diminished during the twelve months by 2,481.

Births and Deaths.

(2) The total births registered numbered 4,226, or six less than in the previous year. The total deaths amounted to 6,551, as against 4,306 during 1902, the abnormal mortality of 2,245 (or at the rate of over 52 per cent.), being partly caused by an epidemic of measles. Arrivals and departures from the Colony were not enumerated.

The birth-rate calculated on the *mean* total population for the year was 34·78 per mille, and the death-rate on the same basis was 53·91 per mille. The former figure was ·75 below, and the latter 18·60 per mille above, the corresponding results in the previous year. These figures are calculated on the estimated mean population, all races and classes, as obtained from the Registrar-General's returns. Details of the population of the Island of Rotuma, a dependency of the colony, are appended.

(3) Some further particulars regarding the births, deaths, and marriages which took place among the various racial denominations in the colony are afforded in the following tabular statement :—

Races or Nationalities	Births	Deaths	Marriages
Europeans	93	50	23
Fijians	3,244	5,727	1,027
Indians	730	570	349
Polynesians	8	54	9
Rotumans	108	110	31
Half-castes	37	31	16
Others	6	11	4
Total	4,226	6,551	1,459

Nearly all these figures differ rather materially from the corresponding ones for 1902, except the total number of births. The increased mortality has been alluded to in paragraph (2), and there is a falling off in marriages to record, which may perhaps be partly accounted for by the same cause.

(4) The table of vital statistics appended (Return A) relating to the various racial populations in the colony is prepared in accordance with the suggestions circulated in the Model Medical Report Form, and is intended to express the information it contains in a form convenient for comparison with those from other Crown colonies.

Measles Epidemic.

(5) The one prominent occurrence during 1903 was an epidemic of measles, the first cases of which occurred in a straggling way in the vicinity of Suva, and appeared to be indirectly traceable to a convalescent European who arrived from New Zealand.

A special report on this outbreak by Dr. G. W. A. Lynch, the Senior Medical Officer, who was acting for the Chief Medical Officer (on leave) during the whole time of its continuance, is appended. In it is shown that nearly half the aboriginal population was attacked to the number of 44,385 cases, and that the deaths among them from this cause amounted to 1,825, which is at the rate of 41·11 per mille attacked, whereas among the 1,113 cases of measles which occurred in all other races in the colony during the same period the deaths were only 7, or at the rate of 6·28 per mille of cases.

The general epidemic of measles which occurred in Fiji in 1875, attacking almost every native, when their total population was estimated to be 150,000, was accountable for some 40,000 deaths, a ratio of more than one in four.

The greatly lessened mortality from the epidemic of 1903 is attributable to (1) immunity of half the population through previous attack ; and (2) the effect of this immunity of half the population, whose services in attending on the sick, restraining them, and providing for them, were thereby secured ; (3) special teaching and cautions given to the people in every village by means of printed circulars regarding the nature and treatment of measles ; and (4) general advance in instruction and civilisation of the people during the thirty years.

The mortality, which was nevertheless higher than is usual among Europeans and other civilised peoples, is ascribed chiefly to enteritis and dysentery, occurring as sequelæ, and to the "obstinacy and folly, not ignorance," of the adult patients in disregarding the cautions and instructions circulated among them, and in yielding to the impulses of the moment, such as appetite for food, or desire to bathe, without regard to consequences.

No death from measles occurred in any European patient.

Enteric Fever.

(6) At Ba and Rewa, both populous sugar-mill centres, series of cases of enteric fever took place, with some fatalities, and assumed more grave dimensions than heretofore recorded in the colony.

Hospital Statistics.

(7) The subjoined table represents the monthly numerical fluctuations in the admissions to the Colonial Hospital :—

	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Whole Year
Europeans ..	18	6	13	14	7	9	12	8	13	5	12	15	132
Fijians ..	43	47	231	143	45	42	29	45	44	40	54	43	806
Indians ..	50	62	40	39	38	35	73	82	43	33	21	44	560
Melanesians ..	3	7	9	17	4	2	6	2	2	6	3	13	74
All others ..	1	10	5	7	3	3	1	2	4	5	2	15	58
Monthly Totals	115	132	298	220	97	91	121	139	106	89	92	180	1630
Quarterly		545			408			366			311		

(8) The preponderance of admissions in the months of March and April was caused by an epidemic of measles among the native Fijian populations, Indian coolies being immune through previous attacks in India or during the voyage to the colony; and Europeans not resorting to the hospital for this ailment.

(9) Of the admissions to the Colonial Hospital, cases of general disease numbered 899; and local diseases 715. The former included 358 cases of measles, of whom 295 were native Fijians, 20 Melanesians, 25 Indian immigrants or their children born in Fiji, 12 Europeans, and the remaining 6 miscellaneous South Sea Islanders. Dysentery accounted for 99 admissions, of whom 11 were Europeans, 26 Fijians, 6 Melanesians, 54 Indians, and 2 miscellaneous.

Framboesia.

There were 37 cases of secondary framboesia, 35 of whom were Indians; and 95 of tertiary framboesia, 88 of whom were Fijians. The notable diminution in the cases of the last named is due in part to the establishment of provincial hospitals for Fijians, but is also to some extent probably explainable by the adoption of a slightly different system of classifying them in the returns, owing to a temporary change in the medical staff of the hospital. But the absence of primary and secondary framboesia again illustrates the indifference with which the native race regards this damaging disease, and the unwillingness of the people to place themselves under European treatment for it.

Malaria and other Diseases.

Only one case of malarial fever (a Melanesian) occurred. Only 14 cases of syphilis were admitted; these were all Indian immigrants, 1 primary, 6 secondary, 5 tertiary, and 2 inherited. Of gonorrhœa 19 cases in all were admitted, of whom 18 were Indians. No case of syphilis in any stage in a Fijian was recorded throughout the colony.

Tubercular conditions accounted for 31 admissions; 23 of them were Fijians. The 15 admissions for filariasis were all Fijians; while the 13 of anchylostomiasis, and the 7 of guinea-worm, were all Indians, as well as 14 cases returned as anæmia.

Neoplasms.

(10) Among neoplasms 6 were benign (fibroma and lipoma, all in Indians), and 13 were set down as malignant. The malignant cases were as follows, and this information has been forwarded to the Imperial Cancer Research Laboratories, London :—

Epithelioma of face ...	2 Europeans.
Carcinoma of pylorus ...	1 Fijian, 1 Indian.
,, parotid gland	1 European.
,, mamma ...	1 Indian.
Sarcoma of face	1 Fijian (aged 10 years).
,, tonsil	1 European, 1 Melanesian.
,, orbit	1 Fijian.
,, inferior maxilla	1 half-caste Fijian.
Malignant tumour of kidney	1 half-caste Fijian.
,, ,, pelvis	1 native of Africa.
Total	13

Local Diseases.

(11) Of the 715 cases of local diseases, 44 belonged to the nervous system, 37 to the eye, 10 to the ear, 6 to the nose, 18 to the circulatory system, 170 respiratory, 157 digestive, 17 lymphatic, 12 urinary, 57 generative, 16 locomotory, 109 connective tissue, and 62 skin.

(12) Only 4 cases of general injury were received, but 74 of local injuries.

Operations.

(13) Two hundred and ninety-five surgical operations were performed in the Colonial Hospital at Suva during the year, namely, 8 on tumours, 8 on cysts, 88 evacuations of abscesses by incision and drainage, 5 extractions of foreign bodies, 2 operations on veins, 23 on glands, 1 on a nerve, 60 on the skin and subcutaneous tissues, 3 on bones, 3 on joints, 18 were amputations, 3 operations on the skull, 11 on the jaws, nasal cavities and mouth, 6 on the eye, 7 on the thorax, 16 on the abdomen (including 4 laparatomies), 4 on the rectum and anus, 4 on the bladder and urethra (not counting simple catheterisation), 19 on the male generative organs, and 6 on those of the female. Of these operations, 40 were performed on European patients, 157 on native Fijians, 74 on Indians, 10 on Melanesians, and 14 on persons of other nationality.

Deaths in Hospital.

(14) The number of deaths which took place in the hospital was 65, of which 6 occurred in Europeans, 22 in Fijians, 2 in Melanesians, 30 in Indians, and 5 in other persons.

Of the 15 cases of enteric fever (of whom 8 were Europeans, 1 a Fijian, and 6 Indians) no death took place.

Work in Provincial Hospitals.

(15) It is possible this year for the first time to include in this report some particulars of the work carried on in certain minor hospitals recently established in more or less remote parts of the colony for the special convenience and physical amelioration of the aboriginal Fijian population. This work has

been undertaken in connection with reforms suggested in the report of the Commission appointed in 1893, to enquire into the causes and possible remedies for the rapid decline of the native race which has been, and still is, taking place.

Seven of these provincial hospitals have been provided in Fiji proper, and one in Rotuma, each under the care of a resident European medical officer, assisted by a native practitioner, a native dresser, and staff of servants.

(16) The following table shows the class of diseases met with in the provincial hospitals; but must not be taken to represent the general prevalence of acute illness among the natives, because these disappointing people persistently decline to resort to hospital treatment in just those circumstances when they might expect to derive most benefit from European medical skill and nursing:—

The largest number of admissions was for frambœsia in its tertiary stages; next in order came tinæ imbricata (tokelau ringworm), diseases of the digestive system, skin, and respiratory system. Tubercle accounted for 88 admissions, with only 3 deaths, a figure which also points to the preference shown by the native to die on his ancestral hearth, rather than risk missing the beaten path to a future paradise by permitting his "spirit" to depart from him within the four walls of a white man's hospital; even though it be built on his own soil and for his special patronage, and maintained partly at his own expense.

Of the provincial hospitals that at Bua was only opened in May, that one at Nadroga in July, and that at Rotuma in July also. The absence of a return from the one at Ra is accounted for by the illness, absence on leave, and finally resignation of the medical officer in charge of it, and the subsequent loss

TABLE SHOWING THE NUMBER OF ADMISSIONS TO PROVINCIAL HOSPITALS FOR NATIVE FIJIANS, AND THE NUMBER AND CAUSES OF DEATHS THEREIN DURING 1903; AND THOSE OF ROTUMANS SEPARATELY.

	Ba		Bua		Kadavu		Macuata		Nadroga		Ra		Tailevu,&c.		Taveuni		TOTAL.		Rotuma	
	Adm.	D'ths	Adm.	D'ths	Adm.	D'ths	Adm.	D'ths	Adm.	D'ths	Adm.	D'ths	Adm.	D'ths	Adm.	D'ths	Adm.	D'ths	Adm.	D'ths
GENERAL DISEASES:—																				
Measles	2	—	—	—	103	2	19	1	—	—			23	—	5	—	152	3	—	
Influenza	4	—	12	—	3	—	1	—	—	—			—	—	—	—	20	—	—	
Dysentery (ac. & chr.)	15	2	7	1	—	—	5	—	7	2			—	—	1	—	35	5	—	
Pyæmia (neonati)	—	—	—	—	1	1	—	—	—	—			—	—	—	—	1	1	—	
Tubercle	3	1	22	—	23	1	9	—	7	1			12	—	9	—	85	3	3	
Frambœsia	33	—	105	—	—	—	156	4	18	1			27	—	39	—	378	5	2	
Filariasis	3	—	8	—	24	1	6	—	4	—			—	—	9	—	54	1	—	Nil.
Rheumatism	10	—	10	—	3	—	1	—	6	—			—	—	3	—	33	—	—	
Scabies	7	—	3	—	—	—	1	—	—	—			—	—	6	—	17	—	—	
Tinea (imbricata)	9	—	70	—	—	—	102	—	—	—			36	—	14	—	231	—	1	
Neoplasms	8	—	3	—	16	1	7	1	—	—			7	—	1	—	42	2	3	
Poisons	—	—	—	—	6	—	—	—	—	—			—	—	—	—	6	—	—	
Debility	2	—	14	—	—	—	7	—	—	—			—	—	1	1	24	1	—	
Brought forward	96	3	254	1	179	6	314	6	42	4	No Return.	No Return.	105		88	1	1078	21	9	
LOCAL DISEASES:—																				
Nervous System	2	—	5	—	9	—	6	1	—	—			14	1	4	—	40	2	—	
Eye	7	—	29	—	34	—	16	—	—	—			15	—	1	—	97	—	—	
Ear	1	—	5	—	3	—	4	—	1	—				—	6	—	25	—	—	
Nose	—	—	—	—	35	—	—	—	—	—			31	—	1	—	67	—	—	
Circulatory System	3	1	3	—	5	2	4	—	—	—			18	4	1	—	31	7	6	
Respiratory ,,	25	—	20	1	8	—	28	2	8	—			33	2	6	—	128	5	3	
Digestive ,,	26	—	27	2	66	1	19	2	12	—			60	6	6	—	216	11	9	
Lymphatic ,,	4	—	1	—	—	—	—	—	—	—			—	—	2	—	7	—	—	Nil.
Urinary ,,	—	—	4	—	7	—	1	—	—	—			10	—	1	—	17	1	6	
Generative ,,	5	—	6	—	22	—	—	—	—	—				1	1	—	40	—		
Locomotory ,,	6	—	8	—	26	—	5	—	1	—			—	—	—	—	46	—	—	
Connective Tissue	32	—	6	—	8	—	20	—	9	—			8	—	7	—	90	—	1	
Skin	12	—	4	—	30	—	1	—	2	—			112	—	3	—	164	—	21	
INJURIES	10	—	10	—	22	—	7	1	2	—			28	2	9	1	88	4	5	
UNCLASSIFIED CASES	1	—	—	—	—	—	9	1	1	—			—	—	2	—	13	1	—	
Total	230	4	382	4	454	9	434	13	78	4			434	16	138	2	2150	52	60	

The above figures, showing as they do only 25 deaths among 2,210 admissions in the eight different hospitals, including Rotuma (a death-rate of 2·35 per cent.) are in accord with the view, already expressed, that the natives come unwillingly to hospital, and for the most part only for slight or chronic ailments.

or destruction of the registers during the hurricane of January 22nd, 1904.

METEOROLOGICAL CONDITIONS.

(17) The meteorological conditions of the islands as recorded by observations officially conducted at Suva expressed in the accompanying return.

METEOROLOGICAL RETURN FOR THE YEAR 1903.

Month	Temperature						Rainfall		Winds		Remarks.
	Solar Maximum	Minimum on Grass	Mean daily Shade Maximum	Mean daily Shade Minimum	Range	Mean	Amount in Inches	Degree of Humidity Saturation = 100°	General Direction	Average Force (0—12)	
Jan. ..	Not recorded.	Not recorded.	85·1	74·0	90·0—69·8	80	3·53		E.	2	
Feb. ..			85·4	74·6	87·6—67·0	81	4·10		E. S. E.	1 20/31	
March			83·9	73·3	89·5—68·3	79	23·01		E. S. E.	1 17/31	
April			84·1	72·6	89·8—65·0	78	13·49		E.	1 30/30	
May ..			82·0	70·5	86·5—64·5	76	2·64		S. E.	1 25/31	
June ..			81·5	69·0	88·8—64·5	75	1·45		S. E.	1 26/30	
July ..			79·3	67·1	89·3—59·3	72	2·40		S. E.	1 29/31	
Aug. ..			80·0	68·3	85·5—61·5	74	2·51		E.	2 2/31	
Sept.			79·6	67·6	84·0—62·3	74	6·46		S. E.	2 9/30	
Oct. ..			83·7	71·9	88·0—67·0	79	6·70		E.	2 8/31	
Nov. ..			84·7	70·6	88·3—64·5	79	10·02		S. E.	1 20/30	
Dec. ..			87·7	73·0	96·5—68·3	82	4·78		E.	1 28/31	
			83·1	71·0	88·7—65·2		6·76		E. to S. E.	2	

Highest corrected reading of barometer ..30·222, on Aug. 7th.
Lowest corrected reading of barometer ..29·529, on Jan. 17th.
Highest temperature in shade .. ..96·5, on Dec. 24th.
Lowest temperature in shade .. ..59·3, on July 15th.
Greatest rainfall in one day .. ..9·18, on March 14th.
Total rainfall during the year .. ..81·09.
Number of days on which rain fell ..207.

Local deviations from those figures depending upon elevation, distance from the sea and aspect, are of course very considerable, more especially as regards rainfall, and the temperature by night.

The year's weather was on the whole more trying for the human population than usual; but correspondingly advantageous for the principal crops—sugar-cane, cocoa-nuts, and bananas.

PLAGUE.

(18) By way of counterbalance to the losses caused by the measles epidemic, the colony continued to enjoy immunity from bubonic plague.

VACCINATION.

(19) Vaccination was conducted, as heretofore, principally by native practitioners working under supervision by the European district medical officers. The total number of persons successfully vaccinated was only 703, this duty having been seriously interrupted by the measles epidemic.

The lymph was procured from New Zealand, and was of good quality; but the delays incidental to its transmission over considerable distances by sea and land after its reception in the colony necessarily interfered with its efficiency in some of the more remote districts. It was no doubt chiefly for this reason that 58 doubtful and 211 unsuccessful results were enumerated.

FILARIASIS.

(20) Besides the report by Dr. Lynch on the epidemic of measles, which is appended, an interesting note on the occurrence of filariæ in Fijian aboriginals will be found forming Appendix II. From this officer's observations conducted on 608 persons, irrespective of clinical symptoms, it appears that one patient in every four admitted to the Colonial Hospital among the natives proper is the subject of filariasis in one form or another; a result which tallies well with observations made in other parts of Polynesia.

But it does not follow from this that one in four Fijians of all ages, classes, and states of health are affected to this large extent.

RETURN "A."

STATISTICS OF POPULATION, 1903.

(FIJI.)

	Europeans and other Whites	Aboriginal Fijians	Rotumans.	Melanesians	East Indians	Mixed and Miscellaneous	Total
Number of Inhabitants on December 31, 1902 ...	2548	93384	2195	1886	19876	2036	121925
Number of Births during 1903	93	3244	108	8	730	43	4226
Number of Deaths during 1903	50	5725	110	54	570	42	6551
Number of Inhabitants on December 31st, 1903	2591	90903	2075	1967	21501	2037	121074
Increase	43		—	81	1625	1	—
Decrease	—	2481	120	—	—	—	851

Estimated net decrease 851

Arrivals and departures not considered. Decrease accounted for by emigration. Increase due to immigration.

SUPPLEMENT TO RETURN "A."

POPULATION OF ROTUMA, 1903.

District	Europeans		H. Caste		Rotumans		Fuhiman		Nean		Samoan		Fijian		Solomon Islanders		Gilbert Islanders		H. Caste Tongan Rotumans		H. Caste Tokelau Rotumans		H. Caste Fijian Rotumans		H. Caste Australian Rotumans		New Hebridian		Australian		H. Caste Chinese Rotumans	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Noatau	1			1	171	226			4			1	6	2									1				1					
Ihihu	3	1	6	4	310	265	1				3	8	14	2	8		1	3								1			1			
Pepsei	1				65	75	1	1	2	1																						
Juju	3	2			107	111	1		2	1		2					1															
Malhaha ..					74	94									7																	1
Oniofa	1		1		141	138						2			2						1	2			1						
Ihinauhi ..					87	96						1							3	2			2	1								
Total ..	9	3	7	5	955	1005	3	1	8	2	3	14	20	4	17		2	3	3	2	1	2	3	1	1	1	1		1		1	

Total Males ..	1034		Births ..	108
Total Females ..	1041		Deaths ..	110
	2075		Marriages ..	31
			Divorce ..	1

No. 8.—GAMBIA.

MEDICAL REPORT ON THE COLONIAL HOSPITAL, THE INFECTIOUS HOSPITAL AND THE GAOL INFIRMARY.

By R. M. FORD, *Senior Medical Officer.*

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	—	—	—
Anæmia	1	1	1
Anthrax	—	—	—
Beri-beri	5	3	5
Bilharziosis	—	—	—
Blackwater Fever	1	1	1
Chicken-pox	—	—	—
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Debility	7	—	—
Delirium Tremens	—	—	—
Dengue	—	—	—
Diabetes Mellitus	—	—	—
Diabetes Insipidus	—	—	—
Diphtheria	—	—	—
Dysentery	8	3	8
Enteric Fever	1	1	1
Erysipelas	—	—	—
Febricula	9	—	9
Filariasis	1	—	1
Gonorrhœa	4	—	4
Gout	—	—	—
Hydrophobia	—	—	—
Influenza	—	—	—
Kala-Azar	—	—	—
Leprosy	—	—	—
(*a*) Nodular	—	—	—
(*b*) Anæsthetic	—	—	—
(*c*) Mixed	—	—	—
Malarial Fever—			
(*a*) Intermittent—	1	—	1
Quotidian	—	—	—
Tertian	—	—	—
Quartan	—	—	—
Irregular	—	—	—
Type undiagnosed	1	—	1
(*b*) Remittent	14	2	14
(*c*) Pernicious	—	—	—
(*d*) Malarial Cachexia	—	—	—
Malta Fever	—	—	—
Measles	—	—	—
Mumps	—	—	—
New Growths—			
Non-malignant	—	—	—
Malignant	—	—	—
Old Age	—	—	—
Other Diseases	—	—	—
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	1	1	1
Rachitis	—	—	—
Rheumatic Fever	—	—	—
Rheumatism	25	—	26
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	—	—	—
Septicæmia	—	—	—
Sleeping Sickness	5	4	5
Sloughing Phagedæna	—	—	—
Small-pox	—	—	—
Syphilis—	3	—	3
(*a*) Primary	—	—	—
(*b*) Secondary	—	—	—
(*c*) Tertiary	—	—	—
(*d*) Congenital	—	—	—
Tetanus	2	1	2
Trypanosoma Fever	—	—	—
Tubercle—	—	—	—
(*a*) Phthisis Pulmonalis	—	—	—
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculous Disease Bones	—	—	—
Other Tubercular Diseases	2	1	2
Varicella	—	—	—
Whooping Cough	—	—	—
Yaws	—	—	—
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	4	—	4
Circulatory System—			
(*a*) Valvular Disease of Heart	—	—	—
(*b*) Other Diseases	1	—	1
Digestive System—			
(*a*) Diarrhœa	8	1	9
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	1	—	1
Congestion of Liver	1	—	1
(*d*) Abscess of Liver	—	—	—
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	—	—	—
(*g*) Cirrhosis of Liver	—	—	—
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	30	1	30
Ear	4	—	4
Eye	23	—	23
Generative System—			
Male Organs	8	—	8
Female Organs	8	—	8
Lymphatic System	5	—	5
Nervous System	11	4	13
Nose	—	—	—
Organs of Locomotion	23	—	24
Respiratory System	52	8	52
Skin—	—	—	—
(*a*) Scabies	—	—	—
(*b*) Ringworm	2	—	2
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	—	—	—
(*f*) Other Diseases	138	—	139
Urinary System	8	—	8
Injuries, General, Local—			
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	76	1	79
Parasites—			
Ascaris lumbricoides	—	—	—
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	1	—	1
Tape-worm	—	—	—
Poisons—			
Snake-bites	—	—	—
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	—	—	—
Surgical Operations—			
Amputations, Major	—	—	—
,, Minor	5	—	5
Other Operations	—	—	—
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

No. 8.—THE GAMBIA.

Medical Report for the Year 1903.

By R. M. FORDE.

Senior Medical Officer.

Hospital.

As mentioned in my half-yearly report, sent forward in July last, the extensive and much-needed additions and alterations in connection with the Colonial Hospital were completed in the early part of the year, and the wards of the main building were again ready for the reception of patients by the middle of April.

The female bungalow was not finished until June, the old wooden bungalow being utilised in the meantime.

The new bungalow is a very solid stone structure with an iron roof, and though this roof looks low from the outside, it is nevertheless a cool and well-ventilated building, being amply provided with doors and windows, and the heat of the mid-day sun being screened off by a wide verandah.

The general hospital accommodation is now in a very satisfactory state; the wards are spacious, well lighted and well ventilated. Each has its own separate bathroom and w.c., the latter quite apart from the ward. Just lately the European ward has been fitted with mosquito-proof wire-gauze frames to the windows and doors, and it is intended to extend this to all the wards. From experience I am able to report that this gauze in no way affects the ventilation, and the ward keeps cool and free from stuffiness; at the same time, there is an entire absence of mosquitoes, flies, and other flying insects.

The old female bungalow has had, for some months, to be used for the treatment of incurable cases, and it should, in my opinion, be added to the hospital as a permanent ward for the reception of such cases.

Water Supply.

With reference to the water supply of the hospital, a new underground 10,000-gallon tank has been added at the back of the new female bungalow; this, with the iron one of similar capacity, gives an ample supply of wholesome drinking water for the European and native staffs as well as the patients, and is an important addition to the water supply in general.

Changes in the Staff, &c.

A third medical officer was added to the staff during the year, and Dr. J. C. Franklin was appointed, and arrived in the colony on April 9th.

Dr. Chichester went on leave on April 26th, and returned on October 10th.

Dr. F. A. Baldwin returned to headquarters from the Protectorate in April, and was attached for duty to the hospital; he proceeded on leave on September 23rd.

Dr. Franklin was on duty with the West African Frontier Force at Sallikeni from April to July. He was also on duty as Commissioner and medical officer at McCarthy Island from August to December, when he returned to Bathurst to relieve Dr. C. R. Chichester, who was about to proceed to Southern Nigeria.

Of the native members of the staff, Mr. T. B. Wright's appointment as steward, storekeeper, and clerk was terminated on September 30th, and Mr. C. Shaw appointed in his place.

Mr. J. Bright, senior native nurse, was dismissed on September 19th, and Mr. J. G. McCauley appointed to the vacancy.

An additional native male nurse was added to the staff, as it was found impossible to do the work satisfactorily with two.

Expenditure and Receipts.

Receipts—Paying patients	£38	1	3
Sale of medicines	41	6	1
Total	£79	7	4
Expenditure—Salaries and allowances	£2,236	6	9
Maintenance of sick, medicines, &c. ..	819	13	3
Total	£3,056	0	0

Statistics.

As shown in the following tables, there was a decided increase in the number of patients treated at the Colonial Hospital during the year, more marked in the out-patient department, where the number of attendances was nearly double that of previous years.

TABLE A.

Patients in Hospital.

	Remaining in Hospital Dec. 31, 1902	Admitted during the year	Died	Remaining in hospital Dec. 31, 1903	Remarks
Europeans ..	Nil	15	2	1	One black-water fever, one bilious remittent with old age. Both recent arrivals from Senegal.
Natives ..	6	440	31	5	
Civil Police	3	48	2	—	
W.A.F.F ..	1	78	2	2	
Total ..	10	581	37	8	

TABLE B.

Results of Treatment, &c.

	Male	Female	
Patients remaining in Hospital Jan. 1, 1903	9	1	10
Patients admitted during the year 1903 ..	443	128	571
Total number treated	452	129	581
Cured	348	100	448
Relieved	54	19	73
Not relieved	11	4	15
Died	31	6	37
Remaining in Hospital December 1, 1903	8	Nil	8
Total number treated	452	129	581
Average stay in days of patients discharged	20	7	
Average stay in days of patients died ..	18	4	

The deaths were due to the following diseases:—

Diseases	No.	Diseases	No.
Apoplexy	2	Meningitis	2
Abdominal tuberculosis ..	1	Nephritis	2
Beri-beri	3	Pneumonia	5
Broncho-pneumonia ..	3	Pyæmia	1
Bilious remittent fever ..	2	Sleeping sickness ..	4
Blackwater fever ..	1	Tetanus	1
Diarrhœa	1	Senility	1
Dysentery	3	Tropical fever	1
Gun-shot wound	1	Tubercular meningitis	1
Enteric fever	1	Ulcer of stomach ..	1

Table A shows an increase of 99 in the number of in-patients over the return for the previous year.

The death-rate was higher than usual among the native patients. An outbreak of beri-beri at the gaol, necessitating the removal of some of the prisoners suffering from that disease to the Colonial Hospital; pneumonia due to exposure owing to the flooding of the lower parts of the town during the heavy rains; dysentery and an increased number of cases of sleeping sickness, accounting for half the number of deaths.

TABLE C.

Out-Patients.

	Old Cases	New Cases	Total
Male	2494	2678	5172
Female	1523	1782	3305
Total number of cases	4017	4460	8477

An increase of 4,652 on that for the previous year. The prevailing diseases were the following:—

Ascarides, abscess, bronchitis, injuries, constipation, intermittent fever, conjunctivitis, neuralgia, diarrhœa, ophthalmia, dyspepsia, otorrhœa, dysentery, rheumatism, febricula, stomatitis, gonorrhœa, skin diseases, ulcers.

The total number of patients treated at the hospital during the year, including in-patients and out-patients, was 9,058. Of the rarer diseases met with there were: Sleeping sickness, 4 cases; beri-beri, 3 cases; enteric fever, 1 case; guinea-worm, 1 case; syphilis, 2 cases.

European Officials.

There were twenty-three admissions on the sick list during the year, one of whom was invalided. The diseases were: Biliousness, 3; lumbago, 2; congestion of liver, 1; lymphangitis, 1; diarrhœa, 2; malarial fevers, 6; febricula, 4; malarial cachexia, 1; gastritis, 1; strain of knee, 1; gout, 1. Case of invaliding, malarial cachexia. There was no death.

Native Officials.

There were thirty-one admissions on the sick list during the year. The prevailing diseases were: Auralgia, intermittent fever, bronchitis, intercostal neuralgia, colic, lumbago, diarrhœa, lymphangitis, dyspepsia, spinal sclerosis. There was no death and none invalided.

European Non-Officials.

Of these there were twenty-five treated for various diseases. As follows: Biliousness, 5; lymphangitis, 1; blackwater fever, 1; malarial fevers, 10; cellulitis, 1; sprain of ankle, 1; dyspepsia, 1; stomatitis, 1; febricula, 1; synovitis, 1; fracture of ribs, 1; ulcer, 1.

The resident European population during the year was 105, and among these there were 48 admissions on the sick list, a large number being cases of a trivial nature. The total number of malarial fever cases was 16, with one case of blackwater fever and one of malarial cachexia. One case of remittent fever was an officer from a warship recently arrived from Sierra Leone, where most likely the infection took place, as several other members of the crew also suffered.

The two deaths that occurred among the non-official Europeans were members of the French Catholic Mission, who had only recently arrived in the colony from Senegal, where they lived from fifteen to twenty years. One was aged over 70, and died during a severe attack of bilious remittent fever, the immediate cause of death being cardiac failure. The other died from blackwater fever, having had three previous attacks in Senegal.

TABLE D.

The following table shows the number of cases of illness and invalidings among Europeans during the past five years, and the number resident in the colony for each year:—

	1899	1900	1901	1902	1903
No. of Europeans Resident	80	71	88	98	105
,, ,, Treated..	66	90	89	26	47
,, ,, Died ..	1	9	4	2	2*a*
,, ,, Invalided	1	Nil	3	2	2*a*[1]

(*a*) Blackwater fever, and bilious remittent fever.
(*a*[1]) One for malarial cachexia.
One for iritis.

Infectious Diseases Hospital.

There was no cases of small-pox or other infectious disease during the year.

The Gaol Infirmary.

With the exception of an outbreak of beri-beri in the first half of the year, the general health of the prisoners was fairly good. The average daily strength of prisoners was 19, and the following is the number of cases of illness treated during the year:—

In-patients	24
Out-patients	152
Total treated	176

There were eight deaths from disease and one by execution. The causes of death were: Beri-beri, 3; heart disease, 2; Bright's disease, 2; pernicious anæmia, 1.

The prevailing diseases were the following: Beri-beri, fever, boils, œdema, catarrh, rheumatism, constipation, ringworm.

The sanitary condition and arrangements were fairly satisfactory during the year, the gaol premises and yard being always kept in a clean state, the cells and corridors washed regularly and Izal disinfectant freely used.

The ventilation of all the ground-floor cells was much improved by enlarging the openings in the doors and also the windows, and the area of some of the older cells was increased by knocking two into one.

This improvement in the ventilation and area of the cells, with a thorough cleansing and disinfecting, had, in my opinion, the effect of completely ridding the prison of beri-beri, the introduction of which was traced to three prisoners who were sent in from a town in the Protectorate, where it was afterwards discovered the disease existed for some time.

It is now nearly eight months since the last case occurred, and at present the health of the prisoners is very satisfactory.

Lunatics.

A lunatic asylum is not considered necessary in Bathurst, as all lunatics are at present sent to Sierra Leone, where there are at present three under treatment from this colony.

General Remarks.

The general health of Bathurst was fairly good during 1903, though the death-rate among the native population was higher than that of the previous year, there being 49 more deaths. This rise was not due to any epidemic disease, as the town was quite free from any disease of this nature during the year, and, in my opinion, it can only be explained by the exceptionally heavy rainfall, which, keeping the low parts of the town flooded for considerable periods, caused much disease and discomfort among the poorer classes of the natives, who were for days, on more than one occasion, unable to light fires to cook their food or dry their scanty garments.

The average monthly number of deaths for the five rainy months was 34, that for the seven non-rainy months being 25. In the previous year, with a rainfall of only a little over half the average, the number of deaths for the same periods was 23 and 21 respectively. This goes to show the deleterious effect of a heavy rainfall on the public health of a low-lying tropical town such as Bathurst.

The health of the resident European population was satisfactory, apart from the deaths of two members of the French mission already referred to, which were the only serious cases of illness among Europeans, all the other cases being of a mild type.

The total number of Europeans resident in the colony during the year was 105; of these, 48 were treated for different ailments, only 17 being cases of malarial fever, including one case of blackwater fever. This record, though not quite so good as that for 1902, shows a continuance of the improved health among Europeans noticed in that year, as a result, I now have no doubt, of the anti-mosquito sanitation systematically carried out by the Board of Health.

TABLE E.

The following table shows the total deaths from diseases at all ages and under five years, and the rate of each 1,000 of the population of Bathurst for the past five years:—

Year	Total Deaths	Rate per 1,000	Deaths under 5 years	Rate per 1,000	Remarks
1899	327	37·15	137	15·56	
1900	350	39·77	120	13·75	
1901	340	36·63	137	15·56	
1902	266	30·22	112	12·72	
1903	315	35·79	130	14·77	

I wish to express my satisfaction at the benefits derived by the hospital from the addition of the European nursing sisters to the staff; they are of incalculable assistance to myself and the medical officer in charge of the hospital in the nursing of patients as well as in the general management of the institution. Both Europeans and natives are much more ready to become in-patients than formerly, as they now know they will receive proper care and attention in the hands of trained European nurses, which the natives as well as Europeans thoroughly appreciate.

Sanitation of Bathurst.

The town was kept in a fair sanitary condition during the year. The usual scavenging was carried out regularly by a gang of twenty labourers and two horses and carts under the supervision of an inspector and an assistant inspector of nuisances. The filling up of Half Die Swamp was discontinued owing to the difficulty of procuring material, and also the scarcity of labour; a large portion of that already levelled up is now built over, and several streets are laid out on it. All rubbish, consisting of house refuse and leaves, &c., raked up in the streets is carried to the back of the town, where it is burnt and utilised for the filling in of the swamp and levelling up depressions in the open areas.

The question of the disposal of human excreta is at present receiving the attention of the authorities, and the adoption of a "Horsfall Destructor" for the incineration of all excrementitious matter is under consideration, but I am afraid that the cost of any method would be found too large for the revenue of this colony. Some improvement could, however, be brought about with reference to the disposal of human excreta by enforcing the adoption in private houses and compounds of a fixed form of masonry closet to take the place of the present insanitary arrangement of simply digging a hole and putting a cask or barrel into it, over which a box or seat is placed; this allows free percolation of the contents into the surrounding soil, and consequently contamination of the neighbouring wells.

No. 8.—Gambia. Medical Report for the Year 1903 (*Continued*).

An ordinance amending the Public Health Ordinance is now in force for the prevention of the tethering of cattle in the streets for grazing, and the result is that the streets are now almost quite free from goats and horses, &c., which were not alone dangerous obstructions to persons walking or driving, but also attracted insects and produced in other ways an insanitary condition of the town.

The attempt made about two years ago to cover the public wells has turned out a failure, as the covers were made too heavy and constructed on a wrong plan, the result being that they are removed altogether from the wells, which are left open as before.

From the result of our experience of a French pump fixed to a well in Hagan Street I am able to recommend that all public wells be fitted with this model and permanently covered either with corrugated iron or concrete, on the same lines as those followed lately at Lagos. In the dry season at Bathurst, owing to the prolonged drought, open wells become the chief haunts of mosquitoes and other insects, and are to a large extent responsible for the propagation of the former pests in that season, as there are no pools or stagnant water in the town to act as breeding-places for them.

Anti-Mosquito Sanitation.

This was kept up steadily during the year, a special gang of ten labourers being employed for the work, which consisted in the collection and removal of old tins, broken bottles, &c., to be disposed of by burial in the waste lands adjoining the town, and the levelling up of depressions and useless ditches in the town.

Before the rainy season set in, the levelling up and clearing of the grass drains was taken in hand, and it was found necessary to take on ten extra labourers in order to complete the work before the heavy rains commenced. This made a great improvement in the condition of the streets in which these drains are, and there were no stagnant pools remaining, the excess of rain-water flowing rapidly away. These drains require much attention during the rainy season, as they become choked up after every shower by the loose sand washed down from their sides, and from the rank grass and weeds that so rapidly shoot up in their courses.

It is very necessary that they should be put in thorough repair, a month or two before the rains begin, by being properly levelled, and opened up at all the crossings.

The inspector of nuisances continues his bi-weekly inspection of all gardens, yards, and compounds, and reports to me daily the result. Wells and other water receptacles are examined for mosquito larvæ, and a strict watch kept on them to see that they are always kept covered. The public wells which are in the charge of the Board of Health are not, I am compelled to say, a model for the owners of private wells in this respect.

Vaccination

In Bathurst.

In the town of Bathurst vaccination was only carried on from June to November owing to the illness of the Public Vaccinator. In this period there were 378 children operated on with 271 successes. Vaccine on ivory points was the variety used; the lymph supplied was not very active, the majority of the successes being obtained from arm-to-arm vaccination. With a special supply of experimental lymph I had only 50 per cent. of successes.

In the Protectorate.

The Protectorate Medical Officer vaccinated 60 people, of whom only 30 were successful. He was stationed at Sallikeni, on the north bank, for three months, where the people strongly objected to being vaccinated, and could not be persuaded to undergo the operation. Two of the Commissioners were supplied with lymph, but no record of results was kept by them.

1903.

Meteorological Return for the Year.

Months	Temperatures						Rainfall		Winds		Remarks
	Solar Maximum	Minimum on Grass	Shade Maximum	Shade Minimum	Range	Mean	Amount in Inches	Degree of Humidity	General Direction	Average Force	
Jan...	160	—	93	56	37	71·9	—	—	N.W.		Not observed.
Feb.	160	—	100	60	40	75·3	—	—	N.W.		
Mar.	164	—	100	61	39	76·5	—	—	N.W.		
April	160	—	93	64	29	75·2	—	—	N.W.		
May	165	—	88	67	21	75·4	—	—	N.W.		
June	160	—	89	69	20	79·2	5·91	—	Variable		
July..	165	—	89	68	21	79·0	7·13	—	Variable		
Aug.	159	—	89	70	19	79·3	35·87	—	Variable		
Sept.	160	—	89	67	22	79·4	4·15	—	Variable		
Oct...	162	—	91	67	24	79·7	4·07	—	Variable		
Nov.	165	—	92	63	29	79·0	—	—	E.		
Dec...	157	—	89	57	32	73·1	—	—	E.		
Total	1937	—	1102	769	333	922·8	57·13	—			
Monthly Average.	161·4	—	91·8	64·0	27·7	76·8	11·4	—			

No. 9.—BRITISH GUIANA.

Medical Report for the Year ending March 31, 1904.

By J. E. GODFREY.

Acting Surgeon-General.

The following report of the Medical Department for the financial year from April 1st, 1903, to March 31st, 1904, for the consideration of his Excellency the Governor :—

The Surgeon-General, Sir D. Palmer Ross, M.D., C.M.G., went on leave on December 28th, 1903. Doctor Widdup, acting medical inspector, acted until my return to the colony on January 13th, 1904, when I was appointed to act as surgeon-general.

The usual financial and statistical returns, reports from the medical officers in charge of public institutions and districts, a special report from Dr. Teixeira on the cases of small-pox treated at the Isolation Hospital, "Best," and the report of the Government veterinary surgeon, are attached to this report.

II.—Public Medical Institutions.

These institutions have been worked satisfactorily and economically during the year.

The following table shows the number of in- and out-patients treated at all institutions, with the exception of the lunatic and leper asylums, there being a decrease of 7,050 as compared with last year :—

Istitution	Beds M.	Beds F.	Beds T.	In-patients	Cured	Relieved	Not Relieved	Died	Remaining, April 1, 1904	Out-patients
Public Hospital, Georgetown ..	466	234	700	12,952	2,095	8,543	557	1,192	565	40,317
,, ,, Berbice	107	43	150	2,438	717	1,179	222	312	123	16,843
,, ,, Suddie	54	26	80	1,409	246	899	37	169	58	6,961
,, ,, Bartica	24	11	35	252	138	73	8	26	7	439
,, ,, Morawhanna, including Arakaka Ward and Dispensary ..	20	12	32	566	207	245	50	29	10	2,629
Total	671	326	997	17,617	3,403	10,939	874	1,728	763	67,189

N.B.—This Table does not include the number of in-patients remaining on March 31st, 1903.

	In-patients	Out-patients	
1895-96	12,518	38,215	8,666 increase.
1896-97	12,893	46,881	9,401 ,,
1897-98	15,086	56,413	11,725 ,,
1898-99	14,207	75,356	18,064 ,,
1899-1900	11,028	64,460	14,075 decrease.
1900-1901	12,118	53,497	9,873 ,,
1901-1902	13,370	70,410	18,165 increase.
1902-1903	15,410	76,446	8,076 ,,
1903-1904	17,617	67,189	7,050 decrease.

The reports and statistical tables from the medical officers in charge of these institutions are attached to this report, and show the satisfactory work performed by each of them.

I take this opportunity of placing on record the assistance I received in the management of these institutions from the medical officers in charge.

A.—Public Hospital, Georgetown.

Additional ventilation was provided in several of the wards. A good deal remains to be done in this direction, but this will have to be carried out gradually.

The latrines attached to B and C Wards have been almost entirely rebuilt, much to the advantage of the institution and the comfort of the patients.

The Röntgen ray apparatus has arrived, and will, I hope, be in full working order in a short time.

The resident surgeon's remarks in his report on the prevalence of ankylostomiasis are to the point, and are well worthy of consideration.

Of the total deaths, 411, or 34 per cent., died within 72 hours of admission.

I am very pleased to have to again record a low death-rate. This has gradually fallen from 14·2 per cent. of the cases treated in 1890 to 9·2 per cent. in 1902-03. In 1890 the number treated was 8,566, with 1,216 deaths. In 1903-04 there were treated 12,952, with 1,192 deaths,

The net cost (medical attendance excepted) per caput was 25·9 cents per diem, which is slightly higher than last year.

The total expenditure for the year was $66,106·39, against $65,345·20 for the previous year; and the revenue $6,224·22, against $8,825·81.

B.—Public Hospital, New Amsterdam.

There were 312 deaths out of 2,438 in-patients, which gives a death-rate of 12·1 per cent. on cases treated.

Of the total deaths, 105, or 33·6 per cent., died within 72 hours of admission.

The net cost (medical attendance alone excepted) per caput was 36 cents per diem, which is less than last year.

The total expenditure for the year was $19,461·77, against $18,021·23 for the previous year; and the revenue $2,034·29, against $1,339·99.

C.—Public Hospital, Suddie.

There were 169 deaths out of 1,409 in-patients, which gives a death-rate of 11·8 per cent. of the cases treated.

Of the 169 deaths, 57, or 33·1 per cent., died within 72 hours of admission.

The net cost (medical attendance alone excepted) per caput was 32·1 cents per diem, which is more than last year.

The total expenditure for the year was $7,860·87, against $7,734.99 last year; and the revenue $331·71, against $230·69.

D.—Public Hospital, Bartica.

There were 26 deaths out of 252 in-patients, which gives a death-rate of 10·3 per cent. of the cases treated.

Of the 26 deaths, 13, or 50 per cent., took place within 72 hours of admission.

The net cost (medical attendance alone excepted) per caput was $1·13 per diem, which is higher than last year.

The total expenditure for the year was $2,136·99, against $2,003·86 for the previous year; and the revenue $59·96, against $48·27.

E.—Public Hospital Morawhanna, and Arakaka Ward.

There were 29 deaths out of 566 in-patients, which gives a death-rate of 5·7 per cent. of the cases treated.

Of the 29 deaths, 11, or 38 per cent., died within 72 hours of admission.

The net cost (medical attendance alone excepted) per caput was 57·2 cents per diem, which is lower than last year.

The total expenditure was $4,238·89, against $3,828·58 for the previous year; and the revenue $897·29, against $817·40.

F.—Lunatic Asylum.

The Medical Superintendent, Dr. Earle, submits an exceedingly interesting report, and one that is well worthy of careful perusal.

The re-erection of the old almshouse buildings has been completed, and very extensive repairs to the other buildings on the male side carried out.

I much regret to say that there is yet a considerable amount of rebuilding to be done; this cannot be avoided, as the buildings are old, and some of them have been pronounced as unsafe by the Colonial civil engineer.

The steady increase in our numbers taxes the accommodation of the asylum to its utmost limits.

The following statement will show the value of the work done at this institution by the attendants and inmates:—

Farm produce	$7,706·74
Bakery, labour value	853·20
Parching rooms	189·48
Laundry	3,250·00
Tailors' shop	224·08
Sewing room	441·13
Shoemakers' shop	132·75
Printers' shop	87·50
Other tradesmen	9,085·00
Total	$18,969·88

The net cost (medical attendance alone excepted) per caput per diem was 17·4 cents, which is higher than last year.

The total expenditure was $51,012·99, against $47,115·36 for the previous year; and the revenue $1,737·02, against $2,561.85.

G.—Leper Asylum.

The buildings are in very fair order; the grounds are well kept, and the inmates always appear cheerful at my inspections.

The medical superintendent has at times to complain of their unruly behaviour.

There were 22 cases of absconding during the year. It will be noticed that all of these are males. The female asylum is completely surrounded with a high galvanised fence. Unfortunately, the male asylum cannot, on account of its position with regard to the Mahaica Creek, be thoroughly enclosed unless at a very large expense.

There were 82 new cases admitted during the year, of which 50 per cent. were East Indians.

The net cost (medical attendance excepted) was 14·1 cents per diem, which is the same as last year.

The total expenditure was $22,030·14, against $21,754·21 last year; and the revenue $27·00, against $22·00 for last year.

III.—District Dispensaries.

These dispensaries are situated as follows:—

Upper Berbice River.—The dispenser in charge is provided with a corial for the purpose of travelling up and down the upper reaches of the river, his residence being at Ida Sabina.

Upper Demerara River.—The dispenser resides at Akyma. He is provided with a corial, and visits when required.

Moruca District.—The dispenser resides at the Mission at Santa Rosa, and is under the direction of the priest in charge.

Potaro.—The dispensary is about eleven miles from the Potaro Landing. The dispenser resides on the premises, and the dispensary is provided with beds for the reception of urgent cases. This building was erected solely on account of the labourers engaged on the Gold Placers in that locality. I regret to say that the large majority of these people do not recognise their obligations as to paying the nominal sum charged for treatment and maintenance.

Pomeroon River.—The dispenser resides at the mission at Cabacaburi, and is provided with a small boat and a boy to assist him, for the purpose of visiting the different grants and homesteads on both banks of the river at stated periods. He is under the direct supervision of Mr. Humphreys, the magistrate of the district; and owing to their combined efforts I am very pleased to record that there has been a marked diminution in the number of cases of yaws. The dispenser is a most painstaking, hardworking officer, and performs his duties in an exemplary manner.

The following table shows the expenditure in connection with the different dispensaries and the amounts collected from those who are able to pay a small fee according to tariff:—

Dispensary	No. of Paying Patients	No. of Police Patients	No. of Poor Persons Treated	Total	Expenditure	Revenue
Potaro	562	36	87	685	$1,045·88	$217·41
Upper Demerara River	457	18	290	765	345·99	106·13
Upper Berbice River	325	—	517	842	359·76	45·63
Pomeroon	293	49	1,688	2,030	583·46	72·96
Total	1,637	103	2,582	4,322	$2,335 09	$442·13

IV.—Prison Hospitals.

At the periodical inspections these have been found to be clean and tidy, and the sanitary condition satisfactory. The reports of the medical officers in charge are published with the annual report of the inspector of prisons.

The following table shows the number of prisoners admitted and the number of deaths in these hospitals during the year:—

	Admitted to Hospital			Died in Hospital		
	Males	Females	Total	Males	Females	Total
(1) His Majesty's Penal Settlement	332	..	332	16	..	16
(2) Georgetown ..	234	24	258	2	..	2
(3) New Amsterdam	38	3	41	..	..	..
(4) Suddie	58	1	59	..	..	..
Total	662	28	690	18	..	18

V.—Onderneeming Reformatory for Boys.

The hospital attached to this institution is in a satisfactory condition, and is always clean and well kept. The report of the medical officer is published with the annual report of the superintendent. The inmates appear to enjoy fair health. The boys suffer chiefly from malarial fever. There was one death during the year.

VI.—Orphan Asylum.

The children appear to enjoy good health. The sanitary arrangements are satisfactory. The medical inspector has the medical charge of the inmates. There were four deaths during the year.

VII.—Almshouse.

The infirmary wards attached to this institution are under the medical charge of Dr. Matthey, who in addition acts as medical attendant to the outdoor poor, surgeon to the police, and health officer for the port. The cases treated are mostly chronic diseases; as this institution, in addition to being an almshouse for the poor and aged, is a home for those suffering from chronic and incurable complaints; as many of these cases from the public hospitals which are not likely to benefit by further treatment, and are unable to support themselves, and for whom there is room, are sent there; this is unavoidable, as it is essential that the beds at different hospitals should be occupied by those who are likely to benefit by hospital treatment.

VIII.—Immigration.

The report and statistical returns of the medical inspectors of estates hospitals are published with the annual report of the immigration agent general.

The are at present fifty estates hospitals, having accommodation for 3,031 patients.

During the year 90,932 in-patients and 24,503 out-patients were treated.

There were 1,483 deaths, which is equivalent to a death-rate of 16·3 for every thousand cases treated.

These figures show the enormous amount of work done by the medical officers and the amount of medical relief afforded by the planters, as it must be remembered that the whole cost, with the exception of the salaries of the medical officers, is paid by them.

It is my pleasant duty to report that the estates' authorities continue to carry our the requisitions of the medical officers and medical inspector in a most willing manner, and in no instance have they resorted to Section 88 of the Immigration Ordinance No. 18 of 1891, which gives them the right to appeal to the surgeon-general; this is most gratifying, and shows their desire to do everything in their power for the welfare of the immigrants under their charge.

I am also very pleased to record that, with only one or two exceptions, all of the estates' hospitals have, by my special request, been provided with good but inexpensive microscopes, which are of the greatest assistance to the medical officers in diagnosing diseases.

Water Storage on the Sugar Estates.

This continues the same as has existed for years, *i.e.*, the water is stored in open trenches. A water supply in this colony is not satisfactory unless provision is made either for collecting and storing rain-water in tanks or vats, or the bringing of water from uncontaminated sources by means of pipes, and storing it in tanks or vats, care being taken to see that the receptacles for its storage are so situated as to make fouling impossible. The system adopted on Plantation Blairmont, by which the rain-water collected from the roof of the factory buildings is stored in a large concrete tank is, in my opinion, the best. I can quite realise that the expense of such a scheme is a serious obstacle; but this could be spread over a series of years by erecting concrete tanks capable of holding say, 50,000 gallons every year or every second year. The advantages to be gained by having pure drinking water are enormous, and would repay the estates. If cholera were to become epidemic in this colony, the want of a water supply, as indicated above, would be very acutely felt.

Colonial Medical Reports—No. 9.—British Guiana (*continued*).

IX.—Quarantine.

The enforcement of quarantine on account of the existence of smallpox in some of the West Indian Colonies and British Guiana has caused considerable inconvenience to the travelling public, and loss to the mercantile community; so much indeed, that on all sides it is admitted that our quarantine laws and regulations require considerable modification to bring them into line with the more enlightened regulations of other countries. His Majesty's Principal Secretary of State for the Colonies, recognising the importance of the subject, summoned a conference consisting of delegates from British Guiana and all the British West Indian Colonies to meet at Barbados on April 21st, 1904. It is to be hoped that the outcome of their labours will be the adoption of a uniform system, and not, as at present, where each place has its own laws and regulations.

Mr. G. H. Richter and myself were nominated as the delegates from British Guiana.

When the year opened the following places, which had been proclaimed by His Excellency the Governor as infected (Section 9 of Ordinance 3 of 1870), were still liable to quarantine restrictions: Barbados, on account of smallpox; Trinidad, on account of smallpox.

The proclamation against Barbados was withdrawn on May 11th, 1903, and that against Trinidad on February 18th last.

Two batches of French refugees, in all ten men, were placed in isolation on arrival in the colony, and all their belongings were carefully disinfected.

No case of yellow fever occurred in this colony.

Fifteen vessels were placed in quarantine at this port during the year under review.

This colony was quarantined on account of the existence of smallpox by Dutch Guiana, Barbados, Trinidad, Grenada, St. Lucia, Windward Islands, and Bermuda.

Trinidad raised quarantine against British Guiana in January last, aud early in March Barbados, Grenada, and Dutch Guiana also removed restrictions, St. Vincent doing so towards the end of the same month.

Surinam reimposed quarantine against this colony on the occurrence of two sporadic cases of smallpox on March 24th.

When the year closed (March 31st, 1904) this colony was being quarantined by Dutch Guiana, Barbados, and Bermuda.

X.—Vaccination.

Glycerinated calf lymph is imported for the use of public vaccinators.

There were 108,860 successful vaccinations during the year.

The amount voted for vaccination for the financial year was $6,000.00, but supplementary votes amounting to $41,313.00 were passed by the combined Court.

The total spent on vaccination for the year was $35,471.00.

Appendix B. shows the number of vaccinations performed in the different districts in the Colony during the year.

XI.—Health of the Colony.

A.—Death-rate.

The death-rate of the whole colony was 28·9 per thousand, and the birth rate 29·3 per thousand, the births exceeding the deaths by 14.

The death-rate for the city of Georgetown and its environs, exclusive of the country patients at the public hospital, was 44·1 per thousand.

The high death-rate of Georgetown points to the existence of some special cause or causes why the death-rate of the city should be so much greater than that of the Colony generally.

I attribute the causes to the following:—

(i.) The insanitary condition and excessive overcrowding chiefly amongst the lower and poorer classes; this means deficient ventilation and light, and the unfortunates who have to breathe the vitiated atmosphere contract all sort of diseases.

(ii.) Tuberculosis is accountable for 13·9 per cent. of the total deaths, and as the percentage of deaths from this disease for the whole Colony is only 8 per cent., it proves conclusively that the excess of this disease is largely due to overcrowding.

(iii.) Excessive infantile mortality; 22·8 per cent. of the total mortality was due to children under one year of age, and 29·1 per cent. to children under five years of age.

(iv.) Want of a proper way of disposal of sewage. the city is in parts saturated with sewage due to the existence of cesspits, which are always a standing danger to the inhabitants, and one of the factors tending to a high death-rate by including bowel complaints.

B.—Infantile Mortality.

The returns of the Registrar-General for the year 1903 reveal a most appalling mortality amongst infants.

The mortality of children under one year of age to every thousand children born was for—

(*a*) The whole Colony	205
(*b*) The City of Georgetown	334
(*c*) The Blacks	238
(*d*) The East Indians	171

There can only be one conclusion, and that is the infantile mortality for the whole colony is excessive (in England it ranges from 130 to 140 for every thousand births), but for the city of Georgetown it is appalling.

The time has certainly arrived for active steps to be taken to reduce this terrible loss of infant life.

In Great Britain and other countries measures have been taken which have been attended with considerable success. They consist chiefly in giving practical lessons to the mothers amongst the poorer classes in the care and feeding of young infants; in the establishment of milk depôts where the milk is first sterilised and then put up in bottles each containing a feed. The milk is sold at almost cost price, or given away free to the very poor.

I am convinced that no progress can be made in reducing the mortality until we adopt some such measures; and mothers and others having the charge

of young infants realise that milk is the proper food and not the so-called pap and other abominations on which the helpless babe is fed.

C.—Smallpox Epidemic.

I regret to say that during the year smallpox, fortunately of a comparatively mild type, prevailed throughout the Colony. The disease was introduced here from Trinidad. The Government, recognising the gravity of the situation, practically gave the Surgeon-General a free hand to cope with the epidemic, the combined Court voting the money to meet the expenses.

In order to give every inhabitant of the Colony the chance of being vaccinated, every medical practitioner was appointed a public vaccinator. In the outlying districts where the services of a medical man could not be obtained, competent persons were appointed.

The Public Health Ordinance requires every local authority to provide hospitals for the treatment and isolation of infectious diseases, and as the local authority for Georgetown, which is the Mayor and Town Council, were unable to obtain a suitable site in the city or its immediate vicinity, the Government permitted the quarantine station at "Best" to be used for that purpose. Benabs were erected and equipped at the expense of the Mayor and Town Council for patients from the city, the Town Council, in addition, paying 25 cents a day for the maintenance of each patient.

Dr. Teixeira, one of the assistant medical officers of the Lunatic Asylum, was placed in medical charge.

Patients from the country were treated at the expense of the Colony in the hospital attached to the quarantine station.

The Mayor and Town Council of New Amsterdam and the Town Commissioner of Bartica erected isolation hospitals at New Amsterdam and Bartica respectively for the treatment of cases in their districts. A few cases were isolated by the medical officers in some of the villages.

In only a few isolated instances did the disease appear on the sugar estates, where the inhabitants are chiefly East Indian coolies. When it did it was always in unvaccinated persons, and did not spread. This was due to the fact that the persons afflicted were promptly isolated and also that the coolies are well protected by vaccination.

Vaccination was made compulsory for all "contacts."

The isolation hospital was closed on March 31st, 1904, the last case having been discharged on February 27th, 1904.

There were in all 1,821 cases of smallpox reported, of which 1,434 were treated at the isolation hospital.

There were 14 deaths, which is equivalent to a death-rate of ·7 per cent.

I append a special report by Dr. Teixeira on the cases treated at the isolation hospital at "Best." This report is most valuable and instructive. I take this opportunity of placing on record the valuable services of Dr. Teixeira, the skill with which he treated the cases under his charge, and his zeal in looking after the welfare of every one attached to the isolation hospital.

All the buildings and furniture of the quarantine station used for the purpose of treating cases of smallpox have been thoroughly disinfected and painted.

Appendix C. attached to this report shows the total number of cases of smallpox reported and the parts of the Colony where they existed.

D.—Malarial Fever.

Malarial fever has been prevalent throughout the whole Colony. Now that it has been conclusively proved that malarial fever is caused by the presence in the blood of the malarial parasite known as the *Plasmodium malariæ*, and that this parasite is introduced by a species of mosquito called the Anopheles, every endeavour should be made to guard against this disease.

The methods that have been most successful up to the present are:—

(*a*) The taking of small doses of quinine.

(*b*) The filling up or draining of stagnant pools of water in which the Anopheles breed.

(*c*) The prevention of inoculation by Anopheles by the use of mosquito nets.

If everyone would fill up in the grounds round their residences all places where stagnant water can accumulate, we should considerably reduce the number of these mosquitoes by abolishing their breeding grounds; vats should be enclosed with mosquito-proof wire netting. The larvæ are often to be found in vases and other ornaments used for flowers in the house. A few drops of kerosene oil would kill them.

E.—Ankylostomiasis.

The presence of this disease, due to an intestinal worm (the *Ankylostoma duodenale*), is now generally recognised. This disease has been and is still being introduced into the Colony by East Indian immigrants. That it is on the increase admits of no doubt.

It is hardly too much to say that this parasite causes more harm than all the other intestinal parasites put together; and it is a well-established fact that persons suffering from this disease are liable to be carried off by comparatively slight ailments, the whole system being so debilitated and undermined.

It is especially prevalent among the East Indian immigrants, and I am convinced the estates are yearly losing a considerable amount of labour by it. While on this point it may be of interest to give the following quotation from Manson's book on tropical diseases:—

"Ankylostomiasis is an important disease from the standpoint of the employer of native labour. The invaliding and inefficiency which it causes among coolies, not to mention the deaths, are often financially a serious matter to the planter and the mine owner. To them any wisely directed expense or trouble undertaken for the treating and controlling of this helminthiasis will be abundantly repaid by the increased efficiency of the labourer."

Mode of Infection.—It is spread through the agency of dejecta of people suffering from this disease, the embryos finding their way into the human alimentary canal either by muddy water or in the mud or dirt adhering to the hands or food receptacles of the workmen. They may also be introduced through the skin,

and in my opinion and that of several of the medical officers who have closely studied the subject, the disease known in this colony as "ground itch" is due to the irritation caused by the embryos working their way through the skin. Persons who work in contaminated fields and trenches are the principal sufferers from "ground itch."

It is therefore essential to prevent fæcal contamination of the soil and water by the depositing of fæces about huts and fields. This can best be done by the establishment of latrines of a simple kind and suited to native habits. I am convinced that we shall never make any marked progress in stamping out this disease until this is done.

F.—Tuberculosis.

This disease, according to the returns at my command, has been the cause of 8 per cent. of the total mortality of the Colony for the year, but there are strong grounds for believing that the mortality is higher than this. That pulmonary tuberculosis is on the increase, especially in the city, is beyond doubt.

The mortality in Georgetown from this disease was 13·9 per cent.

It is, I think, universally known that consumption is an infectious disease due to minute germs called the "tubercle bacilli." The phlegm or expectoration of persons suffering from consumption is laden with thousands of these germs, and it is by this means that the disease is conveyed from one person to another. These germs are released as soon as the expectoration dries, and, mixing with the dust, infect the atmosphere.

G.—Diarrhœa and Dysentery.

These diseases were prevalent throughout the year and accounted for 12 per cent. of the total mortality. They are largely due to insanitary surroundings, unwholesome food, and the want of good drinking water.

XII.—Subsidised Nurse-Midwives in Districts.

The question of the appointment of competent midwives in the rural districts seems to have been first raised in October, 1893, but apparently no action was taken in the matter until 1898, when, in consequence of the high mortality of young infants and the large percentage of still-births the combined Court at its annual session, on the suggestion of the late Surgeon-General, passed a vote of $480 for the purpose of locating and subsidising, by the payment of $5 per mensem, eight certified nurse-midwives in villages and rural districts. This vote has been since passed at each annual session of the Court, but for the present financial year the amount has been reduced to $200.

The object was to induce the subsidised nurses to reside in the rural districts or villages, and to give their services free to paupers and to others of limited means at a reduced fee according to tariff.

After they had established a practice, the subsidy would be withdrawn and given to another district, and so on; the number thus employed never to exceed eight.

About the same time it was suggested that the Medical Ordinance, No. 5 of 1886, should be amended as follows:—

(i.) To call these women nurse-midwives or midwifery nurses.

(ii.) To register such women.

(iii.) To make regulations.

(iv.) To cancel or suspend certificates for misconduct, professional or otherwise.

(v.) To protect duly certified midwives by preventing uncertified women from practising.

(vi.) To arrange for the examination of all women practising for five years and upwards.

On October 16th, 1900, the Medical Ordinance was amended by Ordinance No. 32 of 1900, Sections 6 to 11, in which the above suggestions were embodied, with the exception that all women who, on a certificate of a Justice of the Peace, duly qualified medical practitioner, or Poor-Law guardian, satisfy the Medical Board that they were practising previous to that date, were to be certified and registered.

The experiment so far has been a failure. This I attribute to the following reasons:—

By Section 7 of Ordinance 32 of 1900 every person who could produce a certificate of having practised midwifery prior to the framing of this Ordinance received a midwife's certificate from the Medical Board; the consequence was that a large number of incompetent women who had had no training received these certificates and in a way legalised their position. These were the very persons who should have been debarred, and no hardship could have resulted if they had been given a year in which to qualify. The class of persons on whom these women practise are themselves steeped in the grossest ignorance, and seem to prefer the ignorant and incompetent so-called midwives to those who have been properly trained and qualified.

I propose reorganising the whole system of training midwives, and to establish for that purpose schools at the public hospitals of Georgetown, New Amsterdam, and Suddie, to encourage the intelligent women from different parts of the Colony to undergo the course of study with a view of their returning to their districts as duly qualified. This, in my opinion, is a much better plan than sending women into districts who are unknown to the inhabitants. These women, in addition to being trained as midwives, will be taught how to feed the young infant, and by this means I hope to be able to assist in reducing the terrible infantile mortality of this Colony.

XIV.—Financial.

A.—Public Hospitals.

The expenditure of these hospitals is detailed in Tables 4, 5, and 10 attached to this report.

The net daily cost of each patient resident in the public hospital, excluding the charge for medical attendance, but including medicine for out-patients, varied from 25·9 cents (Georgetown Hospital) to $1.13 (Bartica Hospital).

The total cost amounted to $99,804.91, and the sums paid into the Treasury to $9,547.47; thus reducing the net cost to $90,257.44, as against $96,933.86 and $85,671.70, respectively, last year.

B.—Lunatic and Leper Asylums.

The expenditure of these institutions is shown in Tables 8, 9, and 10.

The total cost amounted to $73,043.13, and the revenue to $1,764.02, making the net cost $71,279.11, as against $68,869.57 and $66,285.72, respectively, for last year.

XV.—General Statistics.

Tables 1, 2 and 3, attached to my report, refer to general statistics in connection with public hospitals.

Tables 6 and 7 relate to the Lunatic and Leper Asylums.

XVI.—Total Expenditure.

The following table shows the total expenditure of the Medical Department of the Colony for the year 1903-04:—

Salaries	Surgeon-General ..	$5,280.00
	Medical Inspector ..	4,319.99
	Medical Officers ..	109,770.80
	Special Medical Officers	6,360.00
	Staff, Surgeon-General's Office ..	3,074.83
Travelling Expenses, &c.	Surgeon-General ..	66.94
	Medical Inspector..	635.08
	Medical Officers ..	9,867.23
Stationery and Messenger, Surgeon-General's Office		380.86
Hospitals		99,804.91
Asylums		73,043.13
* Epidemic of Smallpox, Isolation Hospital and Certificates		7,485.48
* Vaccination		35,459.13
† *Post-mortem* Fees		3,800.00
Allowances, Medical Superintendent, Leper Asylum (in lieu of private practice and personal)		700.00
Resident Surgeon, Public Hospital, Berbice (house allowance, and in lieu of private practice and personal)		876.00
Dispensaries in Districts, including Moruca ..		2,695.09
Nurse-Midwives in Districts		82.42
Medicines for Poor in Rural Districts		374.45
		$364,076.34

Amounts paid into Treasury—		
Hospitals and Asylums		$11.311.49
Dispensaries		437.82
Certificates, Nurse-Midwives		50.00
Lymph disposed of to Private Medical Practitioners		20·80
		$11,820.11
Net Expenditure ..	$352,256.23	

* Extraordinary expenditure due to smallpox epidemic.

† Charged to Administration of Justice.

A.—HOSPITALS.

Table 1.

General Statistics for the Year 1903-04.

Hospital.	No. of inmates on April 1, 1903			Admitted 1903-04			Discharged in 1903-04			Died in 1903-04			Remaining on March 31, 1904.			Daily average number under treatment		
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
Georgetown	440	208	648	7,840	4,464	12,304	7,128	4,067	11,195	775	417	1,192	377	188	565	427	203	630
Berbice	74	49	123	1,574	864	2,438	1,362	756	2,118	203	109	312	83	48	131	87	45	132
Suddie	41	21	62	932	415	1,347	807	375	1,182	119	50	169	47	11	58	44	20	64
Bartica	6	..	6	197	49	246	178	41	219	18	8	26	7	..	7	4	1	5
Morawhanna ..	9	2	11	450	105	555	425	102	527	24	5	29	10	..	10	13	3	16
Totals ..	570	280	850	10,993	5,897	16,890	9,900	5,341	15,241	1,139	589	1,728	524	247	771	575	272	84

Table 2.

Percentages of Mortality in Public Hospitals, in 1903-04, *on Total Numbers Treated.*

Hospitals.	Percentage. M.	F.	Total.
Georgetown	9·3	8·9	9·2
Berbice	12·3	11·9	12·1
Suddie	12·2	11·4	11·9
Bartica	8·8	16·3	10·3
Morawhanna	5·2	4·6	5·1

TABLE 3.

Classes of Persons Treated and Died in the Public Hospitals of the Colony in 1903-04.

Hospitals	GEORGETOWN						BERBICE						SUDDIE						BARTICA						MORAWHANNA					
Number of Cases	Treated			Died			Treated			Died			Treated			Died			Treated			Died			Treated			Died		
Classes	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
Indentured immigrants	467	224	691	26	7	33	16	3	19	..	2	2	5	..	5															
Unindentured immigrants from estates	1,639	322	1,961	127	25	152	231	100	331	40	10	50	167	34	201	42	13	55												
Unindentured immigrants not from estates	912	257	1,169	215	60	275	413	139	552	60	18	78	473	176	649	36	20	56	20	..	20	1	..	1	67	14	81			
Natives of the Colony	2,009	2,677	4,686	275	223	498	600	412	1,012	87	66	153	256	213	469	39	17	56	156	46	202	17	8	25	319	73	392	19	5	24
Others	3,253	1,192	4,445	132	102	234	314	210	524	16	13	29	72	13	85	2	..	2	27	3	30	..	..	..	73	20	93	5	..	5
Totals	8,280	4,672	12,952	775	417	1,192	1,574	864	2,438	203	109	312	973	436	1,409	119	50	169	203	49	252	18	8	26	459	107	566	24	5	29

TABLE 4.

Expenditure for the Year 1903-04.

Hospitals	Wages and salaries	Maintenance	Total	Credit *	Net Cost
Georgetown	$26,099.81	$ 40,006.58	$66,106.39	$6,224.22	$59,882.17
Berbice	6,698.84	12,762.93	19,461.77	2,034.29	17,427.48
Suddie	3,276.74	4,584.13	7,860 87	331.71	7,529.16
Bartica	1,319.82	817.17	2,136.99	59.96	2,077.03
Morawhanna	1,837.34	2,401.55	4,238.89	897.29	3,341.60
Total	$39,247.13	$60,576.28	$99,804.91	$9,547.47	$90,257.44

* Paid to Receiver-General during financial year.

TABLE 5.

Net Daily Cost of each Patient in Hospital, Expenditure on Out-patients included.

Hospitals.		Daily Cost.
Georgetown	Medical attendance alone excepted	25·9 cents.
Berbice		36 ,,
Suddie		32·1 ,,
Bartica		113 ,,
Morawhanna		57·2 ,,

B.—ASYLUMS.

TABLE 6.

General Statistics for the Year 1903-04.

Asylum	No. of inmates on April 1, 1903			Admitted during 1903-04			Discharged during 1903-04			Died during 1903-04			Remaining on March 31, 1904			Daily average No. under treatment.		
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
Lunatic	501	266	767	112	72	184	61	24	85	59	45	104	493	269	762	498	275	773
Leper	335	99	434	89	18	107	50	1	51	62	14	76	312	102	414	323	101	424
Totals	836	365	1,201	201	90	291	111	25	136	121	59	180	805	371	1,176	821	376	1,197

TABLE 7.

Percentage of Mortality, 1903-04.

Asylum	On Daily Average			On Total No. Treated.		
	M.	F.	T.	M.	F.	T.
Lunatic	11·8	16·3	13·4	9·6	13·3	10·9
Leper..	19·2	13·8	17·9	14·6	11·9	14

TABLE 8.

Expenditure for the Year 1903-04.

Asylum	Wages and Salaries	Maintenance	Total	Credit*	Net Cost
Lunatic	$11,663.15	$39,349.84	$51,012.99	$1,737.02	$49,275.97
Leper	4,895.98	17,134.16	22,030.14	27.00	22,003.14
Totals	$16,559.13	$56,484.00	$73,043.13	$1,764.02	$71,279.11

* Paid into Treasury during financial year.

TABLE 9.

Net Daily Cost of each Patient in Asylum.

Lunatic .. .. 17·4 cents
Leper .. .. 14·1 ,,

C.—COST OF HOSPITALS AND ASYLUMS.

TABLE 10.

Statement of Net Cost of various Institutions.

Institution	1900-1901		1901-1902		1902-1903		1903-1904	
	Cost	No. of patients	Cost	No. of patients	Cost	No. of patients	Cost	No. of patients
Georgetown Hospital	$54,844	8,414	$53,555	9,337	$56,557	10,858	$59,882	12,952
Berbice	18,799	2,289	16,340	2,130	16,681	2,241	17,427	2,561
Suddie..	6,284	713	7,442	1,214	7,504	1,624	7,529	1,409
Bartica	2,100	208	2,019	208	1,956	226	2,077	252
Morawhanna..	3,861	494	3,844	481	3,068	467	3,341	566
Lunatic Asylum	41,847	865	41,974	883	44,564	938	49,275	951
Leper ,, ...	20,750	496	21,787	514	21,732	515	22,003	541

REPORT ON CASES OF SMALLPOX TREATED AT THE ISOLATION HOSPITAL AT THE "BEST."

PUBLIC LUNATIC ASYLUM,
BERBICE,
June 28, 1904.

SIR,

I have the honour to submit for your information the following report of the cases admitted to the Isolation Hospital at "Best" during the recent epidemic of smallpox. The hospital was opened on the 8th of April, 1903, with five patients, and I assumed charge on the 25th, when there were 38 patients. The last admission was on the 21st of February last, and the patient was discharged on the 27th.

The total number of cases by the Register was 1,434, of which 566 were males and 868 females. It will thus be seen that female admissions preponderated greatly over the male, and this may be accounted for (1) because they are more sedentary and "stay-at-home" in their habits; (2) because they are brought more into contact with the disease from nursing and meddlesome curiosity; and (3) from their more rabid aversion to vaccination. The males, on the other hand, live a more outdoor life, and a large number of them under pain of losing their work submit to the operation, however reluctantly.

RACES.

The classification of the various races admitted is shown in the subjoined table :—

Portuguese and other whites	49	or	3·41 %
East Indians and descendants	22	,,	1·53 ,,
Aboriginal Indians	24	,,	1·67 ,,
Mixed races (mainly coloured)	120	,,	8·36 ,,
Chinese	1	,,	·06 ,,
Europeans (born in England)	1	,,	·06 ,,
Blacks	1,217	,,	84·86 ,,
Total	1,434		

East Indians.—Ten were immigrants from India, of which *two* came to the Colony as infants, leaving twelve *Creole coolies.*

The immigrants suffered from the following diseases :

Mod. smallpox	3
Scabies	3
Yaws	2
Psoriasis	1
Chickenpox	1
Total	10

Those of East Indian descent and born in the Colony showed the diseases in table below :

Discrete smallpox	9
Chickenpox	1
Scabies	1
Not sick	1
Total	12

On examination it was found that 10 had never been vaccinated, one had been done recently and successfully (admitted with itch) and the last one was admitted with its mother, but not sick—and was successfully vaccinated at the hospital. The "fractional" admission of East Indian Immigrants appears to me conclusive evidence of the efficacy of vaccination, as it is well known that all of them must be vaccinated before embarking for this Colony. A certain number besides this show from the characteristic pitting that they had previously suffered from smallpox in their own country. Not a few "free" coolies *sought* admission direct at the Isolation Hospital—but besides chigoes and scabies nothing like smallpox was ever seen.

Aboriginal Indians. — Sixteen were admitted for further observation owing to their developing a suspicious rash some days after vaccination in Georgetown. I was at first inclined to the view that this rash might be of the nature of post-vaccinal erythema, as observed in a recent epidemic or rather outbreak in Scotland, but I soon found that everything was against such. For one thing, there was no seeming connection between vaccination and the rash, the post-vaccinal date of the rash was against it and *they all* had the rash, which would have been a phenomenal condition of things. Only those exposed parts of the body showed any marks—and I could come to no other conclusion than that their own explanation was the right one, namely, that the rash was due to mosquito bites and possibly other insects. In support of this view I may state that Mr. Wauklyn in his annual report for 1902 returned seven cases as due to *vermin bites*, or 1·1 per cent. of 607 admitted to hospital but not suffering from smallpox. As, with the exception of three or four, no sign of reaction to vaccination showed on admission, I revaccinated and discharged as soon as a good crop of vesicles became evident at the site of vaccination.

The remaining eight suffered more or less severely from smallpox ; one, Ada S., was in hospital 108 days, the record, and a more or less physical wreck on discharge.

The following table shows the age incidence of those admitted :—

0 to 5	127	or	8·85 %
5 ,, 10	91	,,	6·34 ,,
10 ,, 20	384	,,	26·77 ,,
20 ,, 30	489	,,	34·10 ,,
30 ,, 40	198	,,	13·80 ,,
40 and up	145	,,	10·11 ,,
Total	1,434		

One patient gave her age at 112 ; several were well over 70.

A glance at this table shows clearly that it was essentially adults who were treated for smallpox at the hospital. Infants suffered severely as a rule.

The number of persons who on admission were vaccinated is as follows :—

Vaccinated in infancy	59	or	4·11 %
,, childhood	56	,,	3·90 ,,
,, under ten years ago	57	,,	3·92 ,,
,, over ,, ,,	2	,,	·18 ,,
,, during incubation period	29	,,	2·02 ,,
	203		
Never vaccinated	1,231	,,	85·84 ,,
Total	1,434		

Of those vaccinated "under 10 years ago" twenty-three were done unsuccessfully, and twenty-one successfully *during* the epidemic.

Twenty-nine were vaccinated during the incubation stage of smallpox, the time varying from a few hours to a few days prior to the onset of symptoms of invasion. Although the disease was unmodified where the vaccination had been successful, the two conditions ran their course together, in some instances the vaccination appeared to become aggravated and the resulting scars assumed a keloid form. In some of the *successful* cases the resulting cicatrices were not only not foveated but appeared to me unsatisfactory and of little value as protection against the prevailing disease.

Diseases, other than smallpox are shown below—and I have also included in the table 39 cases in which no ascertainable disease could be made out.

Yaws	Varicella	Scabies	Lichen	Measles	Syphilis	Marasmus	Acne	Mod. smallpox	Not sick
3	18	7	4	1	1	1	2*	28	39

* The same case readmitted.

This gives a total of 104, to which must be added 285[1] cases of confluent smallpox and 1,045[1] of the discrete form of the disease, to bring the total to 1,434.

[1] On 1,330 cases of smallpox { 21·42 % / 78·57 ,,

The total number of smallpox cases therefore is 1,330. The case of marasmus was that of an infant admitted with its mother and died soon after admission. The case of acne[1] was that of a youthful adolescent with evidences of his dirty habits in the form of scabies and chigoes as well as acne. The acne was the typical acne seborrhoea or "blackheads."

I vaccinated the case of secondary syphilis with success, and there was no doubt as to the nature of this disease. The case of measles was in a child that had been successfully vaccinated by Dr. Wishart recently.

With the exception of the case of yaws, it is somewhat remarkable that the table above shows a similarity of diseases (other than smallpox) as given in Mr. Wauklyn's table in his report previously mentioned.

As not sick I include children admitted with their parents and *vice versâ*: I have placed modified smallpox perhaps wrongly on list, but I wished to account for the remaining cases of smallpox pure and simple. The symptoms of invasion, &c., of modified smallpox are exactly similar to those of the unmodified disease, the main distinction being in the behaviour and course of the rash subsequent to their appearance, and of course the much reduced mortality. I saw no case of recurrence of the disease in the same patient.

Boils	51	Severe—many others—attention not drawn because trivial.
Adenitis	161	Painful glandular enlargements, some suppuration, especially in groins.
Orchitis	8	In adults and the aged.
Conjunctivis	16	One case of marked ulceration of cornea—several mild keratitis.
Abscesses	97	Generally of thigh.
Tuberculosis	1	Probably pre-existent, but agravated and ending rapidly fatal.
Bright's	7	Albuminuria with œdema of limbs refractory to treatment.
Paresis of bladder	2	Temporary, with some paraplegia and incontinence.
Pneumonia	3	One death.
Delirium	3	One death—John Henry, probably case of hæmorrhagic smallpox.
Sloughing abscess	5	Of considerable magnitude with much asthenia.
Mammary	4	With one death, abscess a complication (phagedæna).
Enteritis	6	Well-marked diarrhœa, in convalescence.
Menorrhagia	1	With much dysmenorrhœa.
Cervical cellulitis	1	Very bad case, operation performed.
Abortion	1	Four months pregnant.
Pleurisy	1	Dry—not severe.
Œdema of larynx	1	With some glossitis, much dyspnœa and oppression.
Alopecia	1	Marked baldness in a case of confluent smallpox.
	370	Or 27·81 per cent. of smallpox cases (1,330).

The number and nature of *complications and sequelæ* as noted by me are given above. Under "abscesses" I have included multiple abscess as well as single. Where delirium is mentioned I mean delirium after admission. Many patients had this symptom before they were sent into hospital as well.

These complications are quite characteristic of smallpox.

I have omitted to include in this list the cases of *mania*, in all 5; three recovered in time to be discharged from the hospital, two were sent to the public Lunatic Asylum. I understand there are at present two more in this institution, one having become insane some time after her discharge from the "Best"; the other soon after recovery in her own home (*had smallpox at home and not sent to isolation hospital*). Further, I may observe that *hysteria* was not an uncommon condition noted during convalescence in females.

Vaccinations.

Altogether 287 vaccinations were performed by me at the isolation hospital. From this number, however, must be deducted 52 done on labourers, artisans, and others employed temporarily within the precincts of the station. Of the remaining 235, the successful cases amount to 64, the unsuccessful 166, and doubtful 5. The successful cases include admissions in which nothing in the nature of smallpox was diagnosed, children admitted with their parents, but without sign of disease on them, or parents with sick children, &c. These were, as stated in my first report, used as controls against the unsuccessful cases (all of which were persons convalescing from smallpox). It is evident that 64 cases were saved from smallpox by vaccination at the hospital.

[1] Vaccinated successfully.

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Deaths.

The subjoined table shows number, causes, &c., of deaths in the hospital.

No.	Initials	Sex	Age	Date of admission	Date of death	Days in hospital	Cause of death	Remarks
1	A. M.	F.	40	May 24	June 2	9	Pneumonia	In stage of desiccation.
2	J. H.	M.	61	June 15	June 25	10	Confluent smallpox ..	Hæmorrhagic?
3	S. M.	F.	11 days	July 4	July 11	7	(Marasamus and) confluent smallpox.	
4	A. G.	M.	23 days	July 18	July 24	6	Confluent smallpox ..	Malignant form of disease.
5	H. D.	M.	1 day	Aug. 22	Aug. 23	1	Prematurity	Mother with smallpox.
6	R. D.	F.	30 days	Aug. 25	Aug. 30	5	Confluent smallpox ..	Malignant.
7	S. L.	F.	23	Aug. 25	Sept. 4	10	Acute general tuberculosis	Convalescent conf. smallpox
8	D. C.	M.	4	Aug. 7	Sept. 7	31	Malarial coma	Pernicious malaria.
9	R. S.	M.	70	Aug. 14	Sept. 17	34	Senile dementia and diarrhœa.	In stage of desiccation.
10	B. R.	F.	18 days	Oct. 14	Oct. 20	6	Marasmus	Infantile atrophy.
11	M. C.	F.	36	Oct. 2	Oct. 22	20	Confluent smallpox ..	Phagedæna of breast.
12	T. B.	M.	15 days	Oct. 19	Oct. 25	5	Confluent smallpox ..	Malignant.

With the exception of No. 10, all the deaths are attributable, either directly or indirectly, to smallpox. The infants, coloured and one white, turned almost black before they died, and the disease in them was of a very malignant form. The case of tuberculosis ran a very rapid course. According to McCombie, this disease occasionally develops during convalescence from smallpox.

No. 9 was an old vagrant in the stage of senile decay and cerebral softening, with smallpox grafted on an already feeble body.

No. 5, a premature child, but showed no external sign of disease, although the mother suffered severely. No. 1 I attribute to septic pneumonia from pustules in the throat.

The mortality on 1,434 would be ·90 per cent., and on 1,330, ·83 per cent., exceedingly low undoubtedly, but not unrecorded in the literature of epidemics.

But if the mortality is low, the suffering, on the other hand, has been so great that only those who have come into immediate contact with the unfortunate victims can realise it. Hancock, writing on a recent epidemic of smallpox in Iowa, returns the mortality at *about* 1 per cent. Bracken, discussing a "peculiar mild form of smallpox," which appeared in various parts of America, states the striking fact that the total mortality was only a little over 2 per cent., and indeed in some localities without fatal cases. Further, the variation in mortality is well shown in the "American Year-Book of Medicine" (1903), in which the *mean death-rate* from 1880 to 1899 in various countries works out as follows:—

Death-rate per Million.

Germany	Mean	1·8 per million.
Scotland	,,	5·3 ,,
Ireland	,,	9·0 ,,
Sweden	,,	9·3 ,,
Switzerland	,,	22·6 ,,
Holland	,,	24·2 ,,
England	,,	33·8 ,,
Italy	,,	179· ,,
Japan	,,	201·0 ,,
Belgium	,,	206· ,,
Austria	,,	358· ,,
India	,,	475· ,,
Hungary	,,	516· ,,
Spain	,,	605· ,,

The following table shows the number of admissions during the period April, 1903, to February, 1904. From this it will be seen that these were highest in July, and that the months of June, July, August and September account for the bulk of the patients:—

1903.	April	56
	May	151
	June	234
	July	341
	August	312
	September	168
	October	118
	November	40
	December	7
1904.	January	5
	February	2

Concluding Observations.

Pitting was noted in all cases of confluent smallpox and a fair number of discrete. Generally speaking, the pits were *irregular* though well-marked and permanent depressions, and not as typical as the regular foveated cicatrices observed in white skins. I have noticed the same condition in East Indian immigrants. So also it was noticed that depigmentation of the cicatrices about the face was almost *nil* or slight, as compared with white skins. Very little change of colour in black skins could be observed as the papules gradually became pustules. Although in the face typical pits were not common, on the body, on the other hand, notably the limbs, there were several cases of resulting foveated but very shallow cicatrices with absence of pigment.

On Face only.

Elevations.—In a small proportion of cases, confluent and discrete, instead of depressions, marked elevations remained with the falling off of the crusts. I had several opportunities of watching their course, which was in brief this: A thin scab would form on each; after a time it would come off; the process would repeat itself for some weeks and then, after a variable period, the elevations would reach the level of the skin and later would become actual depressions. Trousseau, in his "Clinical Medicine," describes the same appearances.

Blood Examinations.

Leucocytosis.—Although I had not the means of adequate knowledge for carrying out a thorough examination of blood *counts*—still from the little I know it was clear that there was a marked leucocytosis, especially of the mononuclear elements. There was marked increase in the small lymphocytes as far as I could see from the examination of ordinary blood films. As I believe the same appearances are to be seen in chicken-pox, this would be of little avail from a diagnostic point of view. The polymorphonuclear neutrophiles which generally are abundantly found appeared to be much diminished in numbers per film.

Anæmia was not noted as *a leading* symptom, so that blood destruction, either quantitatively or qualitatively, could not have been so marked as might have been expected in an epidemic which in its clinical and external manifestations gave the impression of being severe. As a rule, convalescence, once established, was rapid and complete.

Peeling.—In many cases the palms and soles where the pustules were confluent were cast *en masse*, in some cases the exfoliation being over one-eighth inch thick. The under-surface of the cast skin showed the result of the pustules in the form of a perfect honeycomb, except that the pattern was circular instead of being angular. In these cases the new skin was so tender that for some time the unlucky patients could scarcely walk.

I have the honour to be, Sir,
Your obedient servant,
J. TEIXEIRA, G.M.O.

The Hon. the SURGEON-GENERAL.

ANNUAL REPORT OF THE GOVERNMENT VETERINARY SURGEON FOR THE YEAR 1903-1904.

GEORGETOWN,
May 28, 1904.

SIR,—I have the honour to submit the following annual report for the year 1903-04 :—

During the year 1903-04 epidemics of contagious and infectious diseases were not so frequent as in the year 1902-03. I attribute this not only to the measures enforced under the Contagious Diseases (Animals) Ordinance, but also to the fact that many of the uneducated class, who are owners of stock, are beginning to realise the necessity of quarantine restrictions, &c. In one or two instances they have reported the cases to me themselves, a proceeding unheard of when I first entered upon my duties. I always endeavour to make the owner understand why quarantine restrictions are enforced, the absolute necessity of them, and try to get him to imagine himself in the position of a man whose stock became infected through allowing diseased animals to be at large. Furthermore, I point out how it becomes very much cheaper for him to have his place under the charge of a veterinary surgeon, whose duty it is to make efforts to eradicate the disease, at little or no expense to the owner, whereas unscrupulous persons may be employed to attend to the animals, and try to cure glanders, farcy, &c. These are diseases for which the greatest authorities in veterinary medicine have failed to find a remedy. If mineral tonics are administered they abate the disease for a time, but during that time there is a risk of the contagion spreading to other animals, necessitating their destruction. Had a veterinary surgeon been called in at first such needless loss would have been avoided.

GLANDERS.

In British Guiana, I am pleased to say, cases of glanders are becoming fewer. In England, reports for 1902 and 1903 show a decided increase. The immunity from the disease enjoyed here speaks very highly for the contagious Diseases (Animals) Ordinance, and proves the need for the restrictions we have adopted. By the statistics of cases of glanders in England we see that in 1882 the total number reported was 1,389, while in 1903 the total number reported was 2,490, or nearly double. During the year 1892 there were 3,001 cases of glanders in England. This, I believe, was due to an epidemic of influenza which prevailed. When we remember how the acute febrile disease has the effect of developing latent glanders, and thus converting non-infective into actively infective animals, there seems reason to connect the prevalence of influenza with the rise in the number of horses attacked in 1892.

SEASONS.

During the hot months of the year glanders is most prevalent, but of course in tropical countries this is not so noticeable. The explanation I offer of this fluctuation is that the hot months are more exhaustive, and that fatigue causes premature development of the disease, which might otherwise have continued latent in its pulmonary form. I assume that all visible cases of glanders have previously suffered from nodules in the lungs for at least two or three, and possibly for twelve, months. I know that a febrile condition, especially when accompanied by pulmonary congestion, frequently determines generalisations of the disease, and then the clinical symptoms appear. In Canada the summer and autumn seasons are those in which the favourable conditions for the inhibition of glanders prevail.

METHODS OF SPREAD.

Glanders is spread from horses suffering from a discharge, by means of pails, mangers, nose-bags, water-troughs, &c., or any other intermediate bearer of the active virus.

It is a disputed theory as to whether the disease can be spread by germs floating in the air, but when we consider that dried pus-cells float in the air there is ground to believe that the contagion can be carried in this way from one animal to another. Yet, on the other hand, we must not lose sight of the fact that grooms spend ten and twelve hours a day in infected stables without becoming inoculated. It is said that the floating-germ theory was invented to account for the fact that in an infected stud cases are found in various parts of the stable. This circumstance is more easily explained by contagion from nose-bags, mangers, and pails, and by the constant shifting of horses from one part of the stud to another.

The mysterious horse, showing no signs of disease, that works and eats month after month, whilst horses alongside are infected and destroyed by contagion from it, is an ancient, crusted legend. It dates back from the days when glanders without a nasal ulcer was not acknowledged, and when an enlarged gland, a chronic cough, or an intermittent nasal discharge were not considered symptoms of glanders. It has fallen to my lot to investigate numerous outbreaks of glanders, and rarely have I not been able to find three or four horses showing clinical symptoms which had been overlooked by the owners and attendants. I venture to assert that the horse showing no signs of glanders is a non-infective animal, even though his lungs be studded with nodules. Such a horse, though non-infective, is dangerous, because he may develop clinical symptoms very suddenly, and among them may be one accompanied by an escape of active bacilli.

The spread from stable to stable takes place from the introduction of infected horses which have not developed visible signs of disease, but which subsequently become clinically diseased and infective.

Causes.

Glanders arises only by the introduction into the system of the *Bacillus mallei*, which is found in the discharges from the nostrils, farcy buds, infected glands, and nodules of the lungs.

The bacillus is destroyed when exposed to direct sunlight. It may remain active in clean water for many days. It is destroyed by thorough desiccation, and probably lives nowhere out of the animal body or a bacteriological laboratory for more than three months. It is easily destroyed by the more active disinfectants.

Diagnosis.

Some time ago the diagnosis of some cases of glanders was very difficult, but since the introduction of mallein we need have no difficulty, as an injection will, in 98 per cent. of cases, determine the nature of the disease in twenty-four hours.

Every nasal discharge should be treated with caution until its nature is evident. An unilateral discharge, or a discharge that continues without odour, especially when the appetite remains good, should be considered suspicious. Other aids to diagnosis are: the microscope, cultures on selected media, inoculation of small animals, and Widal's agglutinating test. Some of these are only of value in the hands of an expert bacteriologist. Others require days for their development. Mallein is more trustworthy, more simple, and much quicker. Every *post mortem* that I have performed after the reaction of mallein has revealed typical glanders. Several discussions have taken place lately as to the efficacy of this diagnostic agent, but nothing has been adduced to disprove its value.

Control.

It is only by strict legislation that glanders can be stamped out, and legislation such as ours is what is required.

Anthrax.

There has only been one sporadic case of anthrax throughout the whole year. This is striking testimony for the inoculation theory, a theory the soundness of which has been demonstrated twenty years ago. Being new, some of the inhabitants of this colony were at first reluctant to adopt it. I am not over anxious to adopt new methods, and wait until their usefulness has been well established before urging their acceptance here. Inoculation against anthrax has reduced the mortality in France from 20 per cent. to ¼ per cent. which, I think, is of itself sufficient proof of its reliability.

Anthrax is a most serious disease. Not only does it affect the lower animals, usually fatally, but it is also capable of communication to the human subject. Therefore, anyone who knows, or has reason to suspect, that anthrax is on his estate or premises should not think twice about reporting it. If he fails to notify the presence of the disease it is not too much to say that he may be responsible for the loss of many human lives. It is too grave a matter to be trifled with, and some idea of its virulence can be formed by stating that in the year 1617 over 60,000 persons died in the vicinity of Naples from consuming the flesh of animals affected by this complaint.

Cerebro-spinal Meningitis.

In 1903 there was the sporadic form of cerebro-spinal meningitis among the mules at Pln. Hampton Court. The loss on the estate was considerable.

Board of Agricultural.

The sanitary condition of the Government stock is at present all that could be desired. During the year several epidemics broke out among the fowls, which were speedily eradicated. In February, the shorthorn bull suffered from an attack of congestion of the liver. He has now completely recovered.

John Raleigh,
Government Veterinary Surgeon.

The Hon. the Surgeon-General.

No. 10.—GRENADA.

Annual Reports of District Medical Officers, 1903.

Medical Report of No. 1. District for the Year 1903.

By G. W. Paterson.
Medical Officer and Health Officer.

The health of the district has been good on the whole. There was a slight epidemic of chicken-pox during the second quarter of the year, and a more severe one of whooping-cough about the same time, which was responsible for some deaths among children. Three cases of typhoid fever came under treatment; unfortunately one ended fatally.

"Eruptive Fever."

The subject of chief interest during the year was the introduction into the district of the "eruptive fever" from Trinidad. The first case was that of a woman, who arrived here on April 5th and immediately developed symptoms pointing to the invasion of the disease; she subsequently infected five others. The disease further effected an entrance on three other occasions, but owing to the experience gained in the first case, as soon as a diagnosis was made, they were isolated and the infection did not spread. An isolation station was established at the Ballast Ground, to which were sent all cases developing the disease; such cases in the first instance came from the town and from St. John's and St. Mark's, and subsequently from the shipping after quarantine had been imposed against Trinidad. Fifteen cases in all were treated at the isolation station. There were no deaths. The station was occupied from April 19th to July 21st, and the average stay of each case was 28·92 days, excluding one convalescent case from a vessel riding at quarantine, which was admitted for eleven days after all the others had already been discharged.

No case was discharged till desquamation, was complete. The average duration of the disease, reckoning from the initial symptoms of the invasion till the completion of desquamation was found to be 34·57 days.

There have been marked divergent opinions among medical men in the West Indies as to the exact nature of this disease, which has given rise to a good deal of discussion generally, some of a very polemic character; but the opinion gained ground with experience that it was variola characterised by the mild nature of the disease; in this view, accepted by the majority of medical men, I concur.

It would be of interest to record the characteristics of the disease as observed here. It was communicable, as demonstrated by the first case introduced conveying the disease to certain inmates of the house. In four cases it developed within fifteen days of contagion, so its incubation period can be placed at some time within that limit, probably fourteen days. The invasion was marked by general malaise, fever and headache, the temperature being generally 101° F.; the presence of backache was not marked; these symptoms lasted for three days, when the rash appeared and the temperature dropped.

The eruption was general, appeared first on the forehead and face, where it was at times very abundant, then on the arms, and during the following days spread over the body, the palms of the hands and the soles of the feet being the last to be affected; its presence in the soles sometimes rendered walking painful for a few days—this occurred about the ninth day—the mucous membrane of the mouth and nostrils was sometimes affected. It did not come out in successive crops on the same part of the body, but merely developed in different localities as it made its appearance. The rash consisted of hard papules which slowly enlarged for three or four days and then became partially vesicular at the apex, while the rest of the papule remained hard and prominent; by the sixth day of the eruption the contents of this vesico-papule presented a yellowish appearance like wax, then the pellicle ruptured and there was only a small amount of secretion inside the vesicle—about this time there might be a slight return of febrile symptoms, with perhaps sore throat or conjunctivitis—soon the vesicular apex became brushed off and a distinct tubercle was left. About the ninth day of the eruption pigmentation began to appear. This was a marked characteristic of the disease, till finally were seen tubercles or macules, paler in their centres than the surrounding skin of the patient, with a very dark areola of pigmentation around their bases. As time went on these tubercles became less prominent and both they and the macules contracted, gradually losing their pale centres, while the pigmentation remained and gave an appearance eventually as if ink had been dashed on the part. This black pigmentation occurred in patients with a black skin; the pigment varied in intensity according to the colouring of the skin, in light skins it would be brown.

There was little or no proper pitting, a roughened condition of skin remained from slight prominences of the tubercles and pin-point holes in the skin. This description applied chiefly to the eruption on the face; on the body and extremities the papules passed into better formed vesicles and finally approached nearer in appearance to a pustule, then gradually dried up and when the pellicles fell off a distinct elevation, not a proper tubercle, or a macule, was left. There was no marked umbilication and no crusts were formed, but fringes of skin, remnants of the old vesicles, gradually separated; this process continued on the average up to the thirty-fourth day of the disease, when the patient was considered free from infection.

From the description given it will be seen that the disease differed from chicken-pox in the character and course of the eruption—the hard papules lying at a deep level of the skin, and vesiculating late and partially only with the resulting tubercles in places; not the characteristic pearly, glassy vesicle of varicella. It differed, again, in the abundance of the rash on the face and in its marked prevalence in the palms and soles and in the length of time the disease took to subside.

From typical smallpox it differed in the great essential that the constitutional symptoms were exceedingly mild in proportion to the amount of rash present—some of these cases had the face and body literally covered with a rash as described above, and yet on the eighth or ninth day, apart from some malaise, were quite cheerful and strong—it differed, again, in the absence of an offensive odour, the absence of crust formation and proper pitting, the absence of marked umbilication and complete pustulation.

The relationship, however, of vaccination to the disease was marked, as will be seen by two sets of experiments: I., dealing with the effect of vaccination in preventing the disease, and II., the failure of vaccination on those who had recently suffered from the disease.

I.—Of eleven inmates of a house, one contracted the disease in Trinidad which developed after returning home. Three submitted to vaccination,

which was successful, and did not contract the disease. One had suffered from smallpox in infancy and did not contract the disease (vaccination subsequently failed in this case). Four would not submit to vaccination and contracted the disease. The remaining two were men, not vaccinated, but who had little to do with the house and did not contract the disease.

II.—Fourteen cases who had suffered from the disease were vaccinated during convalescence and some again subsequently, and in only one case was there a vaccine vesicle produced.

The means adopted for stamping out the disease were as follows:—

(1) Observation of passengers arriving from Trinidad for fourteen days; then later on imposition of—

(2) Quarantine for sixteen days of vessels with crew and passengers from the same port.

(3) Isolation of cases suffering from the disease at an isolation station.

(4) Disinfection (*a*) of vessels with cargo and clothing and bedding of crew and passengers, (*b*) of dwellings in which the disease occurred.

(5) Vaccination or revaccination of contacts.

As a case under observation developed the disease it was sent to the isolation station, all contacts vaccinated and the building disinfected; these contacts would then have to present themselves for inspection daily for sixteen days. At the termination of the quarantine period, if all were well on board, the vessel would be discharged after disinfection; but if a case had occurred it would be transferred to the isolation station, and the vessel would have to ride out a further period of quarantine; this took place on three occasions. While at the isolation station the following local treatment of cases was carried out: the body would be sponged with creolin lotion and then smeared over with boracic or creolin ointment, and each case would be given an antiseptic bath of perchloride of mercury before discharge. The disinfectants used were sulphur for fumigating purposes and perchloride of mercury in solution for disinfecting soiled clothing and bedding.

Quarantine.

During the year quarantine regulations were imposed against Trinidad and Demerara, and that in existence against Barbados when the year began was taken off on May 18th.

The quarantine station was not occupied during the year.

One hundred and forty-nine Bills of Health were issued.

Medical Relief.

The total number of attendances on all classes under the Medical Relief System amounted to 2,773 for the year.

The number of vaccinations successfully performed were 215—several prosecutions had to be undertaken under the Vaccination Ordinance.

The number of deaths certified were 98.

There was one inquest and two *post-mortem* examinations of dead bodies.

Medical Report of No. 2 District for the Year 1903.

By P. F. Macleod.

Richmond Hill,
February 26, 1904.

Besides the facts mentioned in the monthly reports there is nothing of interest to add to this report.

Sanitary Conditions.

The sanitary condition of the district is exactly as it has been for years, no improvement has taken place in the manner in which the people live. No attention is paid to sanitation neither in dwellings nor their surroundings, conditions that to the intelligent mind should be pregnant factors in causing and disseminating disease. Yet the health of the inhabitants does not appear to be much affected thereby.

No disease assumed an epidemic form, and the only disease that mention need be made of was an unusual number of cases of infantile diarrhœa in the months of July and August.

The death-rate in this class was considerably above the normal in these months. Meteorological conditions, improper feeding, and exposure I regard as the principal factors as a causation.

Water Supply.

The want of a water supply in the lower parts of the district is a matter that should receive the consideration of the Government. The inhabitants are entirely dependent on pond-water during the wet season, and in the dry months have to travel miles to secure this necessary article of life, and then it is procured from a source that is liable to contamination.

The attendances for vaccination were fairly regular throughout the year.

Very few cases of yaws came under observation.

Medical Report of No. 3 District for the Year 1903.

By N. S. Durrant.

Morne Gay,
January 30, 1904.

The health of No. 3 District during 1903 was good. In the early part of the year the alarm occasioned by the appearance of a case stated to be one of varioloid varicella in St. George's caused extra efforts to be made to get the people vaccinated. In this district the appeal to the adult population was in vain. All persons coming from infected places were examined daily for a fortnight, but no case, fortunately, developed.

Towards the end of the year whooping-cough broke out, and, as in the case of chicken-pox or measles when it reappears after a number of years, only stops when every child in the district has had the specific complaint.

Judging by the number of new board cottages erected the people are prosperous.

I was absent on vacation leave from April 24th to October 29th, 1903.

The details of the work performed during the six months are:—

Vaccinations	253
Free medical and surgical attendances	512
Labourers attended under Government scale of fees	584
Death certificates	37

Medical Report of No. 4 District for the Year 1903.

By R. D. O'Neale.

Gouyave,
February 15, 1904.

The general health of the district was fairly satisfactory during the whole year, with the exception of the diseases as mentioned below.

Malaria fever was very prevalent, it being entirely absent from the district for only two and a half months, March, April, and half of May. The most severe and greatest number of cases occurred during the month of October. The disease is accountable for fourteen of the certified deaths.

Whooping-cough.—During the year a severe epidemic of whooping-cough disturbed the health of the children; commencing in June, it did not completely disappear until the month of December, and then only from the want of fresh subjects to attack. Although the number of cases attended was large, and the type of the malady, especially at the commencement of the epidemic, severe, the deaths recorded from such a fatal infantile disease were comparatively small, the total number being only seventeen.

Dysentery.—A good many cases of dysentery were attended, but this disease did not during any month of the year assume any epidemic form. The greatest number of cases were attended during the month of October, and the cause and origin of the disease appears in the majority of cases to have been malarial.

Sanitary Condition.—There is nothing of importance to report in the sanitary condition of the rural portion of the district; the condition of the roads leading to some of these villages has already been pointed out by me in my monthly reports, and is worthy of attention.

The sanitary condition of Gouyave may be said to be fairly satisfactory. Although a good deal has been done by the Sanitary and Town Boards with respect to the abatement of nuisances and cleaning of the town, the drainage of the Duncan's Town portion is in much the same condition as pointed out by me in my annual report of 1899, doubtless the carrying out of a proper and efficient system being prevented by the heavy cost it would entail.

Water Supply.—The proposed new water supply to Gouyave will undoubtedly prove a great boon to the inhabitants. A better supply than the present one has been a long-felt necessity.

Vaccination.—Under the head Vaccination the attendance was very satisfactory, 308 successful vaccinations being performed; compared with the previous records of four years this is the largest number performed in any year. The Chaumier's lymph gave most satisfactory results.

Medical Report of No. 5 District for the Year 1903.

By H. Bishop.

St. Patrick's,
February 2, 1904.

Malaria.—The endemic disease malaria formed a large percentage of the cases that came under observation, particularly during the latter half of the year. The disease was not confined to the more swampy localities, but was met with, though less frequently, in the hilly parts of the district. The type was usually the mild quotidian, for which, unless the attack was unduly prolonged, the patient did not as a rule seek medical treatment. Chronic invalidism with organic disease, the result of old-standing malaria, was also frequently met with.

Improper feeding and intestinal parasites were largely responsible for the gastro-enteric disorders so frequently met with among children.

Dysentery.—During the month of August a few cases of dysentery of a mild type were seen. In October the disease again appeared, and there was a steady increase in the number of cases during November, when it threatened to become epidemic. At the end of the year there were still a few cases under treatment. The disease was confined to the St. Patrick's portion of the district. In the more educated classes, where instructions as to diet, which forms a very important element in the treatment of these cases, were faithfully carried out the disease never proved fatal. Among the less educated, either from ignorance or inability to carry out the necessary measures, the number of deaths were quite out of proportion to the mildness of the disease. Children and the aged suffered most severely.

Whooping-cough.—Almost all the children in the district under five years of age suffered from the epidemic of whooping-cough which prevailed during the last seven months of the year. The epidemic *per se* did not cause many deaths, but where concurrent gastro-enteric disorders were associated with it, it certainly aided in bringing about a fatal termination.

Eruptive Fever.—One case of "eruptive fever" occurred at Bonair, St. Mark's. The patient was transferred to the isolation station at St. George's, and vigorous measures were adopted to prevent the spread of the disease. These, happily, proved successful.

Yaws.—The disease "yaws" was only by accident encountered. Those affected never seek medical treatment, the popular idea being that doctors' medicine "cures" the disease too rapidly only to cause it to break out afresh with renewed vigour at a later date.

Consumption.—Consumption was more frequently met with than the climatic conditions would lead one to expect. This in some measure can be accounted

for by the housing of the poorer classes, which in some instances is deplorably inadequate. Small, dark, ill-ventilated, one-roomed huts provide shelter for large families; a condition the reverse of hygienic.

During the first half of the year the health of the district may be said to have been very fair, and if taken as representing the normal standard would make that of the second half, when an epidemic of whooping-cough was raging and dysentery and malarial were unduly prevalent, fall far below that standard.

Sanitary Condition.—The primitive hygienic conditions which obtain in the district, I take it, have always existed, and where the population is scattered did not tend to affect to any appreciable extent the public health. These conditions, however, fall far short of the requirements of towns.

The street gutters of the town of Victoria were not kept in a satisfactory condition during the year. It would seem to require the services of at least two men, constantly employed, to cleanse and maintain them in a sanitary condition. The present arrangement is altogether inadequate.

Water Supply.—The town of Sauteurs has suffered in health from the want of a supply of wholesome water and from its proximity to swampy ground, and in the simple unambitious programme for the gradual improvement of the sanitary conditions of the colony by the reclamation of swampy land it, a large and important centre of population, flanked on either side by swampy ground, has a just claim to prior consideration.

Burials.—Burials were frequent in those places removed from the regular burial grounds. From the Duquesne Valley the dead were never taken to the burial grounds, but interred in the cocoa cultivations there, perhaps in dangerous proximity to houses or water supplies, or at an insufficient depth; no supervision being possible in those cases to ensure a proper burial.

The number of prescriptions issued under the Medical Relief Scheme were:—

Paupers	185
Children under 10 years	817
Labourers over 60 years	86
Police and prisoners	25
Labourers under scale of charges ...	1,213
Total attendances ...	2,326
Number of inquests attended ...	4
,, successful vaccinations ...	270

The lymph supplied gave uniformly good results.

Medical Report for No. 6 District.

By W. A. D. Whiteman.

St. Patrick's,
February 25, 1904.

Sir,—I have the honour to submit my report on No. 6 Medical District for the year 1903. Having, however, only been transferred to this district on April 20th last, I am only able to deal with the last seven months of the year.

Health.

During the period under review the health of the district must be characterised as having been exceedingly bad, and the figures below show the enormous amount of work entailed in consequence.

Eruptive Fever.—On April 20th the police reported a case of this disease at River Sallie, which on examination proved only too true. In consequence of this discovery an isolation station was promptly established just outside the village in the River Sallie old house, and this case, together with three others which subsequently occurred, was there isolated and successfully treated. Having already expressed my opinion as to the nature of the disease in a special report on the subject, and given details as to the measures adopted to prevent its spread in my monthly reports, I will now only express my conviction that in dealing with a similar threatened invasion at any future time the rules and regulations drawn up by the General Board of Health might with advantage be modified to some extent. I am of opinion that one large isolation station should be established in St. George's to which all the earlier cases occurring in the districts should be sent, and only when the disease assumes epidemic dimensions should an attempt be made to establish district isolation stations. I make this suggestion knowing the difficulties attendant on securing suitable buildings for isolation stations, and even when these are secured the further difficulties of complete isolation among so ignorant and unreasonable a populace. With incomplete isolation each district station becomes a huge centre of infection and the danger to public health correspondingly great.

Whooping-cough.—An epidemic of this disease prevailed during the whole seven months under review, and played havoc among the children. Even now, at the date of this report, there are still some cases under observation.

Dysentery.—This disease made its appearance towards the end of June, and spreading slowly but surely, continued up to the close of the year. It started in the lowlands where the water supply is of the worst, and though after a time it became general in its distribution, I cannot modify my previously expressed opinion that the cause of these outbreaks is the impure water supply in certain localities, and under certain conditions the disease must necessarily be a regular annual visitor. That its spread becomes more or less general after a time admits of ready explanation, and does not in any way detract from the value of the theory which I venture to advance.

Malarial Fevers.—During the months of July, August and September various types of malaria were prevalent throughout the district, and several cases of typho-malaria occurred in the higher lands where the water supply is from springs pregnant with decomposing vegetable matter.

Yaws.—This loathsome disease is as prevalent as ever, and yet there are but few applications for treatment, it being accepted by the labouring classes as an unavoidable evil.

Venereal diseases appear to be steadily on the increase, syphilis occupying a very prominent position,

yet it is wonderful to note the want of appreciation of the gravity of the disease on the part of victims.

Sanitation.

As in other districts so in this, the sanitary measures adopted are of the most primitive, there being an utter disregard of the most elementary principles of hygiene. It is, therefore, not surprising that so much sickness prevails, and we can only attribute our freedom from severe epidemics of infectious diseases to Providential protection.

Infant Mortality.—Again, the infant mortality is exceptionally high, due entirely to the want of proper food and care; and in this connection I must draw attention to the undoubted degeneration of the rising generation, a fact that must be patent to the most casual observer, and one of serious import to the future welfare of the Colony.

Burials.—I must once more draw attention to the danger to public health arising from the indiscriminate manner in which the dead are buried. The time is now ripe for legislation on this subject, and even more so for the provision of public cemeteries within reasonable access of the different centres of population. At the present time there are but two in the whole parish of St. Patrick, both situated within the town of Sauteurs, and respectively under the complete control of the officiating ministers of the two predominant religious denominations. Such a state of affairs needs no comment, and no blame could be attached to an ignorant populace for gross errors committed in this direction.

Water Supply.—Water is plentiful throughout the district, but with few exceptions is unfit for human consumption.

Vaccinations.—One hundred and seventy-four vaccinations were performed during the seven months, a result due in the main to the excellent quality of the lymph supplied, and also to the eruptive fever scare and prosecutions for non-compliance with the vaccination ordinance.

The attendances under the Medical Relief Scheme (for the seven months) were as follows:—

Free—Labourers' children	1,797	
Paupers and labourers over 60	687	
Police and prisoners	11	2,495
Payment tickets		943
Deferred payment tickets		469
Total ...		3,907
Vaccinations		174
Deaths certified		133
Grand total ...		4,214

Medical Report for No. 7 District for the Year 1903.

By Edwin F. Hatton.

Grand Bras, St. Andrew's,
January 25, 1904.

Sanitary Condition.—The conditions of the rural part of the district offer very little scope for a sanitary report, as there are no public places, except the roads. The drains along many of these roads contain stagnant water throughout the wet season, and form breeding pools for Anopheles mosquitoes. When these pools are near dwelling houses they are certainly a source of danger in spreading malaria.

Water Supply.—The streams and rivulets from which the poorer classes take their water supply, are also a source of danger in spreading dysentery and typhoid. These streams are constantly polluted by manure and other refuse, which have been thrown under the cocoa, being washed into them, and by the washing of clothes in them.

Overcrowding and absence of light and ventilation in bedrooms, with no conveniences for the disposal of excreta, is the rule in the dwelling houses of the labourer and small peasant proprietors.

With regard to the town of Grenville, I can add nothing to my report of last year. There has been no improvement in the sanitary condition of the town. The local health authority tried to compel the town board to make some better arrangement for the cleaning of fish at the Fish Market, but met with little success, the legal procedure proving too cumbersome. After an unsuccessful prosecution in the police court, the town board did make some slight improvement in the scavenging around the Fish Market, but this is still far from satisfactory.

Vaccination.—Vaccination received a stimulus by the presence of smallpox in some of the neighbouring islands, and some four hundred persons were vaccinated in this district.

Smallpox.—On May 4th a man was found in Paraclete suffering from a mild and abortive form of smallpox. He and the other inmates of his house were isolated. This was done under a regulation of the Board of Health declaring "eruptive fever" to be an infectious disease.

This man had recently come from Carriacou where "eruptive fever" was prevalent.

Recent vaccination seems to have protected the other inmates, *i.e.*, his wife and three young children, as no other case occurred. On June 4th, after burning bedding and clothing, and fumigating the house, he was set free.

Whooping-cough.—Whooping-cough was epidemic in the first half of the year. Dysentery prevailed more or less throughout the year, and malaria during the second half.

Enteric Fever.—A few cases of fever of a typhoid type were seen at the end of the year.

Return of duties performed by the Medical Officer of District No. 7 during the year ended December 31st, 1903:—

Number of prescriptions issued—	
Free	1 624
Payment	1,579
Number of attendances on cases:—	
Of Pauper	369
Of Labourers' children under 10 years of age	1,199
Of police constables and prisoners ...	56
Of labourers under scale of charges ...	1,583
Number of deaths certified	153
Number of vaccinations successfully performed	334

Colonial Medical Reports—No. 10—GRENADA (*continued*).

Medical Report for No. 8 District.

By H. J. L. Bennett.

St. Andrew's,
February 20, 1904.

Owing to Dr. Lang's retirement, I was transferred from No. 6 District to No. 8; but did not commence my duties in St. Andrew's until the end of October, when I returned from vacation leave: this report, therefore, deals only with two complete months—November and December, 1903.

Dysentery.—On my arrival I found dysentery very prevalent; but the disease was in a mild form, and the deaths caused by it were chiefly among the aged and very young. Malarial fever cases were also very numerous, as is usual at that season, most of them occuring in the low lands near the sea: the inhabitants about Soubise suffered most.

Heart Disease.—Comparing my present district with my last one, I soon noticed a great difference in the amount of heart disease in the two parishes; I met with many more cases in St. Andrew's than I did in St. Patrick's, and I consider the cause to be the very steep hills which the people have to climb in No. 8 district.

Cancer.—Cancer is another complaint which seems to be very common in this parish, but the increase is probably a general one throughout the island; for this disease is gaining ground in most parts of the world.

Venereal Disease.—All forms of venereal diseases were frequently seen; the fact of Grenville being a "port of entry" explains the mode of introduction of these complaints into St. Andrew's, for seafaring men are not too careful.

Water Supply.—The greater part of No. 8 district is blessed with an excellent water supply, the reservoir is situated on high and isolated land more than four miles from the town, and after passing through filter-beds, the water is distributed by pipes over a large area of the parish.

Yaws.—The disease "yaws" was often met with, but did not appear to be so common as in St. Patrick's; only once during the two months was I asked to treat a case. The peasants still look upon "yaws" as something their children must pass through, like the changing of their teeth.

Sanitary Conditions.—As in other parts of the island, many insanitary conditions flourish in St. Andrew's. Overcrowding in the houses, exclusion of fresh air, burials in private gardens and cocoa fields, improper feeding of infants, careless disposal of night soil, lack of appreciation of the dangerous nature of the sputa and fæces in certain diseases such as consumption and dysentery, and the dirty habits and utter helplessness of the poorer classes when nursing one another in illness.

During the prevalence of dysentery I was astonished to find how scarce milk was in this district. I attribute most of the mortality in the dysentery cases to the want of this indispensable form of food; it is not only scarce, but the small quantity obtainable is generally fraudulently diluted.

Returns for November and December, 1903:—

Free presciptions	290
Payment prescriptions	270
Deferred payment tickets	13
Paupers	72
Labourers	256
Labourers' children	181
Aged labourers	28
Police and prisoners	2
Deaths certified	23
Successful vaccinations	9
Payments per tariff	119
Total attendances	714

Medical Report for No. 9 District.

By G. N. Alexis.

St. David's,
January 29, 1904.

I took charge of the district in the month of October. During the earlier part of the year it was under the charge, for varying periods, of Drs. Whiteman, Redhead and Cremona.

Diarrhœa.—On taking over the district I met a rather severe type of diarrhœa prevalent among the children, and a large percentage of those attacked died from asthenia and failure of the circulation. Fatal results in the majority of cases have been brought about by improper feeding and nursing; this is not to be wondered at when it is remembered the important part dietary and hygiene play in the treatment of these cases.

There were no other features worth recording.

Medical Report for No. 10 District for the Year 1903.

By Dunbar Hughes.

Carriacou,
March 12, 1904.

I took charge on October 15th, 1903, and during the preceding months the district was under the care of Dr. G. N. Alexis.

Malarial Fever.—These fevers are always endemic in Carriacou, and during the month of November they assumed a more than usual violence, the type was chiefly remittent, and cerebral symptoms were present in all the more severe cases.

Syphilis.—A few cases of primary syphilis, and in some cases tertiary; prompt and continued treatment, usually in hospital, have tended to lessen the spread of this disease. I have adopted the plan of keeping primary syphilitics under hospital supervision and treatment as long as possible; for to treat these cases as out-patients would not be effective, as the sufferers soon notice improvement and discontinue attending for treatment.

Yaws.—Only three cases of this disease have I met with.

Water.—Notwithstanding the fact that the water supply of Carriacou affords every facility for contamination, yet I am happy to say that there has not been a single case of a purely water-borne disease.

The prevailing diseases have been those of the digestive system. The habitual diet of "cuckoo," and the drinking of a water that holds in suspension much siliceous matter may be responsible for this state of affairs.

Children.—Infant mortality in Carriacou is excessively high, and in 85 per cent. of cases death is referable directly or indirectly to dietetic indiscretions.

Soon after birth the hapless infant begins its digestive career by an attack on a pap made of arrowroot and brown sugar or molasses and of the consistency of very thick starch paste, and before "he" has reached the age of five days "he" has received a "soothing syrup" known locally as "Luck," and composed of castor oil, olive oil, honey, and gin.

After the age of six months it continues its existence on "cuckoo."

Facts such as these speak for themselves, and the helplessness of the infants calls on us to intervene between the ignorant kindness of the mother and the infant's life and comfort.

METEOROLOGICAL RETURN FOR THE YEAR 1903.*

	Temperature						Rainfall		Winds	
	Solar minimum	Solar minimum on grass	Shade maximum	Shade minimum	Range	Mean	Amount in inches	Degree of humidity	General direction	Average force
January	142·6	131·2	82·3	72·5	9·7	·699	5·09	72·2	E.	143
February	144·8	141·0	83·0	72·8	10·2	·716	2·27	73·4	E.	162
March	144·3	135·2	84·3	73·0	11·7	·715	2·48	73·0	E.	127
April	145·5	137·0	86·5	74 6	11·9	·705	0·65	69·4	E.	135
May	142·8	135·0	86·6	75·6	11·0	·721	1·42	69·6	E.	155
June	140·0	133·0	84·5	74·7	9·8	·776	8·73	78·4	E.	134
July	137·7	130·0	83·4	74·3	9·1	·788	10·00	80·2	E.	112
August	139·7	127·2	84·1	74·7	9·4	·791	14·59	78·2	E.	68
September	143·9	135·0	85·4	75·1	10·3	·776	9·51	74·8	E.	72
October	143·6	132·0	84·7	75·1	9·6	·808	9·11	77·6	E.	88
November	146·7	140·4	85·5	74·9	10·6	·794	2·55	76·8	E.	78
December	141·2	126·0	83·6	73·1	10·5	·762	12·49	70·2	E.	107
Averages ..	142·7	133·6	84·5	74·2	10·3	·754	78·89	74·5	E.	115

* At Richmond Hill Meteorological Station in the south of the island.

RETURN OF DISEASES AND DEATHS IN 1903 AT THE FOLLOWING INSTITUTIONS:—

COLONY, YAWS, ST. ANDREW'S, AND CARRIACOU HOSPITALS.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	—	—	—
Anæmia	41	2	44
Anthrax	—	—	—
Beri-beri	—	—	—
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	—	—	—
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Debility	11	—	12
Delirium Tremens	—	—	—
Dengue	—	—	—
Diabetes Mellitus	1	1	2
Diabetes Insipidus	—	—	—
Diphtheria	—	—	—
Dysentery	25	5	25
Enteric Fever	—	—	—
Erysipelas	—	—	—
Febricula	—	—	—
Filariasis	—	—	—
Gonorrhœa	12	—	12
Gout	—	—	—
Hydrophobia	—	—	—
Influenza	2	—	2
Kala-Azar	—	—	—
Leprosy	—	—	—
(*a*) Nodular	—	—	—
(*b*) Anæsthetic	—	—	—
(*c*) Mixed	—	—	—
Malarial Fever—			
(*a*) Intermittent—	11	2	13
Quotidian	—	—	—
Tertian	—	—	—
Quartan	—	—	—
Irregular	—	—	—
Type undiagnosed	—	—	—
(*b*) Remittent	90	5	90
(*c*) Pernicious	1	—	2
(*d*) Malarial Cachexia	—	—	—
Malta Fever	—	—	—
Measles	—	—	
Mumps	—	—	—
New Growths—			
Non-malignant	16	—	16
Malignant	2	—	2
Old Age	—	—	—
Other Diseases	—	—	—
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	—	—	—
Rachitis	—	—	—
Rheumatic Fever	—	—	—
Rheumatism	41	—	45
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	—	—	—
Septicæmia	—	—	—
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox	—	—	—
Syphilis—	—	—	—
(*a*) Primary	1	—	1
(*b*) Secondary	9	—	10
(*c*) Tertiary	9	-	12
(*d*) Congenital	1	—	1
Tetanus	3	1	3
Trypanosoma Fever	—	—	—
Tubercle—	29	16	36
(*a*) Phthisis Pulmonalis	—	—	—
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculous Disease of Bones	—	—	—
GENERAL DISEASES—*continued.*			
Other Tubercular Diseases	—	—	—
Varicella	—	—	—
Whooping Cough	—	—	—
Yaws	141	1	192
Yellow Fever	—	—	—

LOCAL DISEASES.

Diseases of the—			
Cellular Tissue	27	—	32
Circulatory System—			
(*a*) Valvular Disease of Heart	30	7	33
(*b*) Other Diseases	10	2	11
Digestive System—			
(*a*) Diarrhœa	6	5	7
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	—	—	—
Congestion of Liver	2	—	3
(*d*) Abscess of Liver	—	—	—
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	1	—	1
(*g*) Cirrhosis of Liver	1	1	1
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	68	1	71
Ear	—	—	—
Eye	—	—	—
Generative System—			
Male Organs	32	1	33
Female Organs	—	—	—
Lymphatic System	17	—	18
Nervous System	25	2	27
Nose	14	—	14
Organs of Locomotion	33	1	33
Respiratory System	24	1	26
Skin—	—	—	—
(*a*) Scabies	—	—	—
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	6	—	6
(*f*) Other Diseases	243	5	278
Urinary System	76	11	78
Injuries, General, Local—			
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	45	5	51
Parasites—			
Ascaris lumbricoides	2	—	2
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	—	—	—
Tape-worm	—	—	—
Poisons—			
Snake-bites	—	—	—
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	—	—	—
Surgical Operations—			
Amputations, Major	—	—	—
,, Minor	—	—	—
Other Operations	—	—	—
Eye	—	—	—
(*a*) Cataract	5	—	6
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	19	—	24

No. 11.—HONG KONG.

REPORT ON THE HEALTH AND SANITARY CONDITION OF THE COLONY OF HONG KONG, FOR THE YEAR 1904.

By J. M. ATKINSON.

Principal Civil Medical Officer.

LAID BEFORE THE LEGISLATIVE COUNCIL BY COMMAND OF HIS EXCELLENCY THE GOVERNOR.

Population.

The estimated population of the Colony for 1904 was 361,206. There were 1,205 births and 6,118 deaths; 495 of these were from plague.

The birth-rate was 3·3 per 1,000, as compared with 3·17 in 1903.

The death-rate was 16·94 per 1,000, as compared with 18·9 in 1903.

The following figures will show the comparison of the death-rate in the Chinese and non-Chinese during the past two years:—

	1903.	1904.
Non-Chinese	16·6 per 1,000	12·48 per 1,000.
Chinese ...	19·1 per 1,000	17·18 per 1,000.

Prevalence of Sickness in the Different Seasons of the Year, and General Character as to the Mildness or Severity of the Diseases Prevailing.

Small-pox.—There were 64 cases notified, as compared with 60 in 1903. The greater number of these, viz., 57, occurred in the first six months of the year; five were imported.

In the month of April handbills were published calling the attention of the Chinese to the fact that the disease was prevalent and free vaccination could be done at the Government Civil, the Alice Memorial and the Tung Wah Hospitals.

Cholera.—A small outbreak occurred during the months of May, June and July in No. 2 Health District, and was confined almost entirely to the coal coolies resident in this neighbourhood; at no time was the disease epidemic.

In all there were 41 cases notified during the year, as compared with 10 in 1903, and 460 in 1902.

Plague.—This disease occurred in a much milder form than usual, 510 cases only being notified, as compared with 1,415 in 1903; this is the fewest number of cases we have had recorded in any one year since 1897.

The diminished prevalence of the disease is especially interesting, as it appears to have been very severe in Canton and the surrounding country; it was especially prevalent in Tong Kun District; at Fu Shan, about 40 miles east of Canton, upwards of a hundred deaths had occurred by the beginning of April, indeed in some of the districts near Canton it was reported as causing more deaths than in any year since 1894. Early in April information was received that the disease was prevalent near Swatow.

As will be seen from the following table, the outbreak commenced in April, it reached its height in June, and a marked decline occurred as soon as the maximum mean daily temperature was reached.

The following table gives the number of cases reported in each month of the last two years:—

	1903.	1904.
January	4	0
February	29	3
March	115	4
April	272	40
May	515	135
June	343	194
July	85	96
August	32	19
September... ...	9	9
October	5	0
November	4	5
December	2	5
	1,415	510

To my mind, one of the most important plague preventive measures is the general cleansing of the Chinese houses, which is now carried out by the inhabitants themselves during the winter months. The fact that we have been able to obtain the co-operation of the people in this way is in a great measure due to the personal interest Sir Henry Blake took in endeavouring to quell the 1903 outbreak.

This commenced in November, 1903, and was finished by the end of February, 1904. During this time over 11,000 houses, containing 34,193 floors, were cleansed by the Chinese, the Sanitary Department supplying the hot water, soft soap, and removing the rubbish at a total cost to the Government of $6,123.

Four days' notice is sent to the occupiers that the time has arrived for their houses to be cleansed, at the end of this time they are visited by the Plague Inspector and if found dirty the sanitary staff take the matter in hand and cleanse the premises.

The Chinese have now come to see the value of this measure, and only in a very few instances did they fail to do it in the allotted time.

Colonial Medical Reports.—No. 11—Hong Kong *(continued).*

At the end of the first cleansing it was determined by the Board to continue it throughout the year, this was done until September, and in this way the Chinese houses were thoroughly dealt with at least two or three times.

In the winter of 1904-1905, the cleansing commenced on November 1st, and was completed by February 1st of this year; during this time 12,677 houses in Victoria, Kowloon, Shaukiwan and Aberdeen, containing 34,193 floors, have been dealt with in this way, and 805 cartloads of rubbish have been removed. The total cost to the Government for the necessary fuel, soft soap, &c., was only 1,131·32 dollars.

The inhabitants are assisted by the Plague Staff, whose services are thus utilised in non-epidemic times.

It is intended to continue this work throughout the summer.

Rats.—Twenty-one thousand nine hundred and seven rats were caught during the year, of these 993 were found to be plague infected.

From Dr. Hunter's researches it is evident that it is the rats which bridge over the period between successive outbreaks; during all the winter months cases of plague-infected rats are found, although the disease is at this time practically non-existent in man. The method by means of which plague is spread from rat to rat and from rat to man has yet to be worked out.

An attempt was made early in the year to kill off the rats with Danysz' virus; the strain, however, must have become attenuated, as although it was freely distributed, and there were evidences of its having been eaten, a fatal effect was not induced.

Seeing the successful results which have been last year produced in the Province of Charente in the South of France by Professor Roux, where the rats were practically exterminated by the fatal epidemic induced by this virus, we have applied to the Pasteur Institute at Paris for a more virulent strain of the virus, and we hope to have better results this year.

If we can only diminish in this way the number of rats and at the same time persuade the Chinese to continue the periodical cleansing, we shall do much, I am sure, to diminish the annual prevalence of plague in this colony.

We cannot expect, however, to be free of the disease until many of the insanitary and filthy dwellings in the crowded quarters of the city have been demolished and reconstructed on approved sanitary principles.

With this end in view the Government is voting an annual sum of money for the resumption of these insanitary areas.

Enteric Fever.—This disease has been somewhat more prevalent, at no time, however, was it epidemic: 129 cases have occurred during the year, as compared with 44 in 1903, and 55 in 1902. Nearly one-half of these occurred during the last three months of the year. Thirty-three of the cases were imported.

Malarial Fevers.—To show the diminution which has occurred since 1900, the year in which anti-malarial measures were instituted, I give the admissions from this class of endemic diseases to the three hospitals whose returns are given in these annual reports for the last four years :—

Admissions from Malarial Fever.

	1901.	1902.	1903.	1904.
Government Civil Hospital	787	349	346	221
Gaol Hospital	98	63	93	59
Tung Wah Hospital ...	508	404	205	210
Totals	1,393	816	644	490

At all these hospitals the diagnosis of this disease is made by means of the microscope.

The annual number of cases of malarial fever at these hospitals has thus fallen in four years from 1,393 to 490; no clearer proof can be required of the efficacy of these measures.

Beri-beri.—This disease has been much more prevalent, 739 deaths having been reported, as against 397 in 1903. An enquiry into this disease is now being conducted by Dr. Koch and the Government bacteriologist, and it is to be hoped that some light will be thrown upon this malady about whose etiology so so little is really known.

Dengue.—There were only 43 cases admitted to hospital, as against 123 in 1903, and 422 in 1902.

The following table gives the number of cases of infectious disease notified in each month of the year :—

Disease	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Plague	3	4	40	135	194	96	19	9	...	5	5	510
Small-pox	3	14	24	10	6	3	1	1	...	...	2	64
Enteric fever	3	19	8	3	6	8	6	10	3	17	34	12	129
Scarlet fever	1	...	...	...	...	...	...	...	...	...	...	1	2
Diphtheria	1	...	...	...	...	1	...	...	2	1	1	...	6
Puerperal fever	...	...	...	...	1	1	1	...	...	...	1	2	6
Cholera...	...	...	1	...	16	19	5	...	...	...	...	...	41

General Sanitary Condition of the Colony.

Marked improvement may be noted as evidenced by the diminution in the death-rate for the past three years as shown by the following figures, by the milder outbreak of plague last year, and by the diminished incidence of malarial fever.

	Death-rate per 1,000. 1902.	1903.	1904.
Chinese	21·93	19·1	17·18
Non-Chinese	19·00	16·6	12·48

The steady enforcement throughout the year of the overcrowding and cubicle sections of the Public Health Ordinance must have had a beneficial effect.

During the past year the Government has resumed at a cost of $200,000 an insanitary block of 38 houses in one of the most overcrowded parts of the city; this lot is bounded on the north by Gough Street, on the east by Aberdeen Street, on the south by Kau U Fong, and on the west by On Wo Lane.

The following have been erected and opened during 1904 :—

(1) A public bath-house at Pound Lane with accommodation for 28 males and 10 females.

(2) A public latrine in the eastern portion of the city; and

(3) Three public latrines in the city.

Vaccinations.

The following vaccinations were performed during the year :—

Government Civil Hospital	639
Victoria Gaol	2,578
Alice Memorial Hospital	277
Tung Wah :—	
Victoria	1,811
Aberdeen	15
Stanley	17
Shaukiwan	46
Kowloon	86
	5,469

Meteorological Return.

Month	Barometer at M.S.L.	Temperature			Humidity		Cloudiness	Sunshine	Rain	Wind	
		Max.	Mean	Min.	Rel.	Abs.				Dir.	Vel.
	Ins.	Deg.	Deg.	Deg.	P. c.	Ins.	P. c.	Hours	Ins.	Points	Miles per h.
January ...	30·20	64·9	59·5	55·4	72	0·37	49	185·2	0·120	E. by N.	13·8
February ...	30·12	68·1	62·6	58·5	69	0·40	37	207·5	0·200	E.	13·9
March ...	30·00	67·0	63·2	60·3	87	0·51	97	29·7	3·755	E. by N.	14·6
April	29·96	75·2	70·7	67·8	86	0·65	83	112·4	1·905	E.	14·8
May	29·88	80·8	75·6	71·8	83	0·74	73	148·0	7·705	E. by S.	12·8
June	29·72	85·0	79·8	76·0	83	0·84	72	162·1	19·640	S.E. by E.	9·9
July	29·67	85·9	81·1	77 9	82	0·88	76	147·4	7·225	S.S.W.	10·9
August ...	29·70	86·0	80·8	77·2	83	0·87	68	172·6	27·640	E. by S.	13·2
September ...	29·88	85 0	80·2	76·3	81	0·84	66	161·3	9·770	E.	11·5
October ..	30·01	80·1	76·5	73·3	74	0·68	58	191·2	2·005	E. by N.	14·1
November ...	30·15	74·0	68·8	64·6	62	0·45	55	187·3	0·215	E.N.E.	13·1
December ...	30·23	66·1	60·7	55·7	62	0·34	45	201·7	0·230	E.N.E.	10·6

Return of the Statistics of Population for the Year 1904.

	Europeans and Whites, including Portuguese and the Army and Navy	Africans, East Indians and Malays, including Indian Troops	Chinese	Total
Number of Inhabitants in 1904	13,106	5,794	342,306	361,206
,, Births ,, ,,	199	64	942	1,205
,, Deaths ,, ,,	137	99	5,882	6,118
,, Immigrants ,, ,,	...	..	149,195	149,195
,, Emigrants ,, ,,	...	...	76,304	76,304
,, Inhabitants in 1903	12,771	5,810	307,050	325,631
Increase ...	335	...	35,256	35,591
Decrease ...	...	16	...	16

RELATIVE MORTALITY IN THE DIFFERENT SEASONS, 1904.

POPULATION: NON-CHINESE, 18,900; CHINESE, 342,306.

Months	Non-Chinese Deaths	Rate per 1,000	Chinese Deaths	Rate per 1,000	Total Deaths	Total Deaths, excluding Plague and Small-pox
January	12		328		340	340
February	17	9·9	315	12·21	332	327
March	18		402		420	405
April	16		451		467	415
May	18	11·8	619	19·06	637	499
June	22		561		583	407
July	30		646		676	571
August	23	15·0	630	20·99	653	630
September	18		521		539	529
October	19		476		495	495
November	22	13·1	483	16·46	505	501
December	21		450		471	466
Total	326		5,882		6,118	5,585

RETURN OF DISEASES AND DEATHS IN 1904 AT THE

Government Civil Hospital, at the Victoria, and at the Tung Wah Hospitals, Hong Kong.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	59	—	59
Anæmia	15	1	15
Anthrax	—	—	—
Beri-beri	812	337	812
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	—	—	—
Cholera	20	15	20
Choleraic Diarrhœa	2	1	2
Debility	211	33	211
Delirium Tremens	—	—	—
Dengue	43	—	43
Diabetes Mellitus	1	—	1
Diabetes Insipidus	1	—	1
Diphtheria	3	—	3
Dysentery	182	22	182
Enteric Fever	44	12	44
Erysipelas	12	—	12
Febricula	128	—	128
Filariasis	—	—	—
Gonorrhœa	60	—	60
Gout	1	—	1
Hydrophobia	—	—	—
Influenza	—	—	—
Kala-Azar	—	—	—
Leprosy	—	—	—
(*a*) Nodular	7	—	7
(*b*) Anæsthetic	—	—	—
(*c*) Mixed	—	—	—
Malarial Fever—	490	60	490
(*a*) Intermittent—	—	—	—
Quotidian	—	—	—
Tertian	—	—	—
Quartan	—	—	—
Irregular	—	—	—
Type undiagnosed	—	—	—
(*b*) Remittent	—	—	—
(*c*) Pernicious	—	—	—
(*d*) Malarial Cachexia	2	—	2
Malta Fever	—	—	—
Measles	6	—	6
Mumps	3	—	3
New Growths—			
Non-malignant	13	—	13
Malignant	21	11	21
Old Age	—	—	—
Other Diseases	—	—	—
Pellagra	—	—	—
Plague	142	64	142
Pyæmia	—	—	—
Rachitis	—	—	—
Rheumatic Fever	1	—	1
Rheumatism	98	—	98
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	4	—	4
Septicæmia	8	7	8
Sleeping Sickness	—	—	—
Sloughing Phagedæna	5	—	5
Small-pox	10	—	10
Syphilis—	—	—	—
(*a*) Primary	98	13	98
(*b*) Secondary	61	—	6
(*c*) Tertiary	—	—	—
(*d*) Congenital	2	—	2
Tetanus	8	8	8
Trypanosoma Fever	—	—	—
Tubercle—	—	—	—
(*a*) Phthisis Pulmonalis	19	10	19
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculous Disease of Bones	—	—	—
GENERAL DISEASES—*continued.*			
Other Tubercular Diseases	—	—	—
Varicella	—	—	—
Whooping Cough	3	—	3
Yaws	—	—	—
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	144	1	144
Circulatory System—			
(*a*) Valvular Disease of Heart	—	—	—
(*b*) Other Diseases	74	32	74
Digestive System—			
(*a*) Diarrhœa	—	—	—
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	—	—	—
Congestion of Liver	—	—	—
(*d*) Abscess of Liver	—	—	—
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	—	—	—
(*g*) Cirrhosis of Liver	—	—	—
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	475	91	475
Ear	10	—	10
Eye	101	—	101
Generative System—			
Male Organs	93	—	93
Female Organs	19	4	19
Lymphatic System	68	—	68
Nervous System	115	21	115
Nose	—	—	—
Organs of Locomotion	65	—	65
Respiratory System	784	357	784
Skin—	—	—	—
(*a*) Scabies	—	—	—
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	—	—	—
(*f*) Other Diseases	166	—	166
Urinary System	68	22	68
Injuries, General, Local—			
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	23	2	23
(*c*) Other Injuries	659	38	659
Parasites—	17	—	17
Ascaris lumbricoides	2	—	2
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	—	—	—
Tape-worm	—	—	—
Poisons—			
Snake-bites	—	—	—
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	1	1	1
Surgical Operations—			
Amputations, Major	—	—	—
,, Minor	—	—	—
Other Operations	—	—	—
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

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REPORT ON THE INFECTIOUS DISEASES HOSPITAL.

This report on the Infectious Diseases Hospital, together with comments on the cases treated during the year ending December 31st, 1904, is written by Dr. Koch, the Medical Officer, and addressed to the Principal Civil Medical Officer for the Colony.

The Plague Epidemic.—The outbreak of plague, as was generally anticipated, I think, was not of an extensive nature, but the intensity of the disease was comparatively great and the mortality high. Thus of a total prevalence of 510 cases, or perhaps it would be more correct to say that this number of cases was notified, the deaths amounted to 497—a percentage of 97·4, this being only one decimal point lower than the death-rate in 1902, which was the heaviest since the appearance of plague in 1894.

The Variety.—There were 59 cases of bubonic plague admitted and 18 cases of the septicæmic variety. No cases of the pneumonic or the intestinal variety came under treatment. This is naturally too small a number to work with satisfactorily as regards statistics, still it is not uninteresting to consider percentages. The bubonic variety constituted 76·6 per cent. and the septicæmic variety 23·4 per cent. of the cases admitted. Comparing this with regard to the total cases notified, I find that the percentage of bubonic cases is only 63·6 and of septicæmic cases 31·4, the cases of pneumonic plague only constituting about 5 per cent. The difference in the percentages of cases notified and cases admitted for treatment is, I think, due to the fact that to the native mind plague is invariably associated with the presence of a bubo or glandular swelling, and hence probably there is a greater chance of such a case of bubonic plague being taken for treatment or taken away from the colony, whereas the septicæmic variety conveys but a vague impression of the disease and of infectivity and is not brought for treatment, but is only diagnosed at the mortuary.

Pneumonic Plague.—There were no cases under treatment.

Intestinal Plague.—No cases of this variety were admitted, nor indeed did any occur during the year. I think it can be safely stated that of the numerous cases of plague that have been under observation since 1894 in all parts of the world this particular variety has been conspicuous by its rarity. The evidence on its behalf is weak. It should be remembered that the plague organism is not a very resistant one, that heat and sunlight rapidly destroy it, and desiccation caused by a high atmospheric temperature is also rapidly fatal to it. Apart from this, it is known that it is extremely sensitive to the action of mineral acids which have a powerful and rapidly destructive effect on it. Under these circumstances primary infection of the alimentary tract—to constitute the intestinal variety—by infected food seems highly improbable. And this apart from the fact that proof is still needed to demonstrate the presence of the plague organism in the foodstuffs sold in the open market.

Sex Incidence.—Of the 77 admissions, 54 were males and 23 females, giving percentages of about 70 and 30. This ratio is not, in my opinion, expressive of a greater susceptibility on the part of the male sex. The susceptibility of the sexes is alike of the same degree. The difference in the ratio is to be explained on other grounds, most probably concealment and removal of the female sick.

Its Incidence with Reference to Nationality.—All the patients, with the exception of two Indians, were Chinese. Contrary to what obtained last year, no Europeans were admitted suffering from the disease—in point of fact, no European contracted the disease this year.

Age Incidence.—My numbers are not large enough to do anything more than to indicate that in the bubonic variety males were affected between the ages of 16 and 40, and females fairly evenly during the quinquenniads of life up to 70 years. The septic variety prevailed among males principally between the ages of 16 and 35.

Recovery-rate.—Of the cases of bubonic plague, 3 males and 6 females recovered, and of the septic variety, 4 males and no females. This gives a total of 13, a percentage of nearly 17 on the cases admitted. Analysing them still further we arrive at these percentages:—

Bubonic plague ...	Males 8 per cent.	Females 29 per cent.
Septic plague ...	Males 25 per cent.	Females *nil*.

These percentages depend upon numbers too small to generalise from.

Death-rate.—This amounted to 82 per cent. of the cases admitted and gives percentages with reference to the bubonic and septic variety as follows:—

Bubonic plague ...	Males 91·6. ...	Females 71.
Septic plague ...	Males 73. ...	Females 100.

Here, too, these percentages should not be used too implicitly; for instance, only two females suffering from septic plague were under treatment, and both died, giving this enormous percentage. It is quite probable that with a large number under treatment the results would not have been the same.

It will be noticed that the death-rate among those under treatment amounts to 82 per cent., whereas in all cases notified it amounts to 97 per cent. This may be held to demonstrate what is evident, that the care and attention a patient receives in hospital give him a better chance of recovery—with reference to the number we are dealing with, we have a difference of 15 per cent. On the other hand, however, I am inclined to the opinion from the cases which I have had the opportunity of observing both in this hospital and in the Tung Wah Hospital, that the heavy mortality on the total cases notified indicates that the disease appeared in a more virulent form, and that no treatment at present known was likely to have had any beneficial result.

Does Early Treatment on the Onset of the Disease Tend to Direct it to a Successful Issue?—I have drawn up a table showing the duration in days of the illness previous to admission. It will be seen that on the

third day after the onset 12 cases of bubonic plague were admitted of whom 1 recovered, and 2 cases of septic plague of whom also 1 recovered. On the fourth day of illness 16 cases of bubonic plague were admitted of whom 2 recovered, and 2 cases of septic plague which succumbed. The history could not be definitely obtained from 20 cases of bubonic plague, and 9 cases of septic plague. These cases were admitted practically *in extremis*, and I am strongly of opinion that the disease was of very recent onset—certainly not more than four days. It will thus be seen that 61 of the 77 cases were admitted comparatively early, and that active treatment had no effect on them, for only 4 recovered, or a little over 6 per cent. Hence I conclude that the disease was of a much more severe type than in 1903: that in spite of cases having been brought in early general poisoning of the system by the plague organism was developed so early, and was of so intense a character that no treatment could have prevented a fatal issue.

As a corollary I append another table (No. V.) howing the length of residence in hospital of patients who died. It will be observed that 8 died within six hours of admission, 13 within twelve hours, 16 within eighteen hours, 4 within twenty-four hours, 11 within two days, and 4 within three days. Only 7 cases lived for a longer period. Thus 41 cases died within the first twenty-four hours—they were in a hopeless condition, and no treatment however energetic could have availed them. Until a serum is discovered which is as efficient in its action as the antitoxin of diphtheria we must rely upon the natural immunity of the human body to antagonise the poison of the plague bacillus, and in our present state of knowledge we are unable to say how long the bacillus remains in the blood before this immunising action becomes of sufficient potency to neutralise the poison and its action.

The Distribution of the Bubo in Bubonic Plague.—The number of cases of bubonic plague amounted to 76·5 per cent., as compared with 23·5 per cent. of cases of septic plague, that is, a ratio of 3 to 1. As it has been asserted lately that one of the principal avenues of infection is by means of the alimentary tract (through the medium of food), this preponderant proportion of the bubonic variety is noteworthy. That there is direct infection and inoculation by abrasions and wounds of the skin there is no doubt, and it must not be forgotten that it is quite possible for direct inoculation to take place through small wounds whose presence may be lost sight of or may remain undetected. A reaction at the seat of inoculation may not always occur—the infective material may be absorbed and conveyed by the lymphatics to the nearest chain of glands without showing that they (the conveying vessels) are affected in any way. In this way the infection may be carried to the more superficial glands or to the deeper. These glands act as a sort of reservoir in which the bacilli accumulate, practically stagnate and partly die; and should necrotic changes be set up they are entirely destroyed and rendered powerless. During this period they elaborate the protein poison which rapidly diffuses through the lymph channels, is taken up by the circulation and acts in the direction of paralysing the vaso-motor nerves, thus leading to hæmorrhagic effusions, to dilated blood-vessels, and to a dilated and debilitated heart. The principal channel of infection, then, being the skin, it is not difficult to understand on reference to Table VI. that most glandular swellings were to be noticed in the femoral region—31; and in the inguinal region—11, and in both femoral and inguinal regions—7—pointing to infection through that part of the body most likely to come into contact with infectious material, the lower extremities. Glandular swellings in the axillary region occurred in three cases, in the cervical region in 4 cases, and in the cervical region in combination with the femoral region in 2 cases. These cervical buboes I attribute to primary infection of the tonsils, which in such cases were enlarged and painful.

The Diagnosis of Plague.—Since we have become familiarised with using for diagnostic purposes a thick blood film decolourised and stained with a basic dye, as was first adopted here by Dr. Bell, there scarcely has been any hesitation in naming as the plague bacillus all organisms that showed a bipolar reaction, and diagnosing as plague any case in whose blood films, prepared thus, these organisms were found. Such a method of diagnosis is far too summary. This cannot be too strongly pointed out and insisted upon. Bipolar organisms, fairly commonly distributed, exactly like the *Bacillus pestis* microscopically, are very easily mistaken for it. Should a patient present the clinical symptoms of plague and a bipolar organism be discovered in the blood we might safely infer without further tests that it is the plague organism. Should, on the other hand, a bipolar organism be found in a blood film or a smear, and the person shows no other sign suggestive of plague, the presence of the organism is most evidently a contamination. Cases have been diagnosed as plague from the presence of this bipolar organism in a blood film without especial reference to clinical symptoms, and mistakes have occurred even when the greatest pains and care have been taken to avoid the possibility of contamination. The diagnosis of plague is a very important matter and should be based upon a clinical as well as a bacteriological diagnosis, and not upon a microscopic diagnosis alone. In the case of the lower animals equally great care should be taken, and no positive opinion can be accepted unless every bacteriological test has been thoroughly worked out and experimental proof obtained. Otherwise the diagnosis not only violates scientific deductions and accuracy but, what is perhaps an equally grave matter, it causes a scare with regard to fresh sources of infection. It should therefore be recognised that the presence in a blood film or smear from any tissue or organ of a bipolar-staining organism does not necessarily mean *per se* that that organism is the *Bacillus pestis*. During an epidemic of plague, or when the patient presents the clinical symptoms of the disease, we may safely conclude that bipolar organisms found in such films are true *Bacilli pestis*, assuming of course that every care and precaution has been taken in making the film so as to avoid contamination. On the other hand, the absence of the *Bacillus pestis* from such films does not negative the diagnosis of plague when clinical symptoms are present.

The Distribution of the Bacillus Pestis.—It is generally accepted that the *Bacillus pestis* is found in the peripheral blood immediately preceding death, but later researches here show that it may be found also at any time during the course of the illness, thus demonstrating the presence of the bacilli in the general blood stream, practically immediately after infection. During the course of the year I paid some attention to this point, and was struck with the varying results obtained, which I have summarised in Table X., and which I shall briefly note here. I may premise that all the cases examined presented the classical clinical symptoms of plague, and that repeated examinations of slides were made in each case.

Detailing the results of my examination it will be noticed :—

(1) That the *Bacillus pestis* was found in some cases during life, and also after death in all the organs—the heart blood, spleen, liver, lungs.

(2) That in some cases (bubonic plague 6, septic 1) the *Bacillus pestis* was not found immediately before death, though it was found on several occasions previously during the illness.

(3) That in other cases (10 of bubonic plague and 1 septic) no plague bacilli could be found during life, but were found after death in the various tissues and organs.

(4) That in 9 cases of bubonic and 1 of septic plague the bacilli were found at the first examination, but not on subsequent examinations.

(5) That in 1 case of bubonic and 1 of septic plague the bacilli could not be found either during life or after death.

(6) That in 9 cases of bubonic and 3 of septic plague which recovered plague bacilli were found in blood films on their admission.

(7) That in 17 cases of bubonic and 7 of septic plague the bacilli were found *ante-mortem*; no *post-mortem* examination was made in these cases.

(8) That in two cases I found the bacilli in the peripheral blood after convalescence had been fully established.

It would seem natural to conclude from these observations that the presence of the *Bacillus pestis* in the blood—the peripheral blood—is not constant, that it is not to be found on every occasion of examination in the course of the disease, nor is it present always immediately before death. It is undoubtedly a fact that the bacilli are always to be found in the bubo during its early stages, but when suppurative and necrotic changes are set up—when the bubo maturates—they cannot always be found. It would seem that streptococcic infection has dominated the position, and that the swarm of leucocytes ingest the plague bacilli and either destroy them or render them inert. In smears from the spleen I was able to find the plague bacilli in the substance of the phagocytes, and in buboes which matured and suppurated I found the bacilli within the substance of the leucocytes while the cocci of suppuration were free. What value is to be placed, as regards its infectivity, on the presence in the peripheral blood of convalescent cases of the *Bacillus pestis* is doubtful. Whether the bacilli are always present in the blood of convalescents, if not always under what circumstances and in which variety of plague, and finally the length of time they persist after convalescence is established, are questions which require elucidation.

The Treatment of Plague.

Owing to the severe type of the disease treatment was practically hopeless in the great majority of the cases, and in addition a large number were brought in *in extremis*. Different methods of treatment were adopted, and I summarise the results.

(*a*) In the first and earliest method, the administration of carbolic acid in large doses, which apparently gave such satisfactory methods in the previous year, was again tried. The cases were put on 12 grains of the pure acid, made up in a palatable mixture every two hours, and this was continued during the whole course of the illness. Carboluria never developed. Digitalis and strychnine by the mouth and hypodermically were also administered. With such large doses of carbolic acid there is often a feeling of depression, a buzzing in the ears, and a feeling of languor and apathy—"as if you were floating in the air when you closed your eye," as one patient expressed it. When the patient is able to appreciate it, the emetations are objectionable. The results by this method were as follows :—

Bubonic plague.—Cases treated	Males	17
	Females	4
Recovered ...	Males	2
	Female	1
Died... ...	Males	15
	Females	3
Septic plague.—Cases treated ...	Males	9
	Female	1
Recovered ...	Males	2
	Female	0
Died	Males	7
	Female	1

(*b*) On the assumption that a bactericide of sufficient strength injected directly into the circulation might be efficacious, I tried a solution of formic aldehyde prepared in the same strength as Maguire uses it in cases of pulmonary tuberculosis. Only three cases were subjected to this treatment. They were all very severe cases, practically hopeless, so the efficacy of this method cannot be estimated; but I am prepared to try it again when opportunity offers. Fifty cubic centimetres were injected directly into one of the veins of the forearm. The following are the particulars of the cases :—

(1) A Chinese male, aged 42, suffering from bubonic plague, with a well-developed left femoral and left inguinal bubo. He was admitted in a practically moribund condition, was delirious, the pulse was very weak and small, and the tongue dry and brown. Stimulants, alcoholic and other, were freely administered, and an injection of 50 cc. of hæmasepsin given intravenously. He died nine hours after admission. At the *post-mortem* examination plague bacilli were found in the spleen but none in the heart blood or in the bubo.

(2) A Chinese male, aged 28, in an advanced stage of septic plague. Had an intravenous injection of

50 cc. hæmasepsin three hours after admission. Seventeen hours afterwards had an injection of 10 cc. of Yersin's serum. Not the least sign of any improvement. Died twenty-two hours after admission. A *post mortem* was made, and smears taken from the organs, which were thrown away by a misunderstanding, so the presence of the *Bacillus pestis* could not be determined.

(3) A Chinese female, aged 48, suffering from bubonic plague. Has a left inguinal bubo and left femoral bubo. No plague bacilli could be found in the blood. She was a well-nourished woman but was in an extremely weak condition. She was given three injections of hæmasepsin, 50 cc. intravenously, on successive days. After the first injection the temperature went down from 102° to 99·4°, but the next day, after the second injection, it ran up to 104·8°. She rallied somewhat, the temperature came down, and oscillated between 100° and 103°. After the third injection she showed some distinct improvement—the pulse became stronger and she was much lighter. Suddenly, however, she changed for the worse and died from heart failure, sixty-seven hours after admission. At the *post-mortem* examination the buboes were crowded with plague bacilli, which were also found in the heart blood and spleen.

(*c*) *Yersin's Serum.* — Great expectations were formed at one time of the curative properties of this serum. As it is prepared, there would seem to be lacking in its composition a complement which should enable it to neutralise or counteract the protein poison secreted by the plague bacillus. With the hope of supplying this deficiency I mixed with it an equal quantity of serum taken from convalescent plague cases, which presumably contained the immune body. This mixture of Yersin's serum plus immune body would by inductive reasoning be quite as efficient as the diptheria antitoxin. In practice, however, it did not prove so.

(*a*) *Treatment by Means of Yersin's Serum Plus Serum from Convalescent Case of Bubonic Plague.*— Three cases were treated by this method. Yersin's serum 10 cc. was mixed with 10 cc. of serum removed from the vein of a convalescent case of bubonic plague, which showed the *Bacillus pestis* in the blood on admission, but not on convalescence. I detail the results.

(1) A Chinese male, aged 27, suffering from septic plague, and showing plague bacilli in the blood on admission. He was given four injections on successive days. The first noticeable result was that diarrhœa occurred, the motions were yellow and very liquid. This lasted for ten days. The pulse was weak. Two days after the last injection the temperature became subnormal, and he had low muttering delirium, and later showed a tendency to drowsiness. The temperature then went up and kept varying between 98° and 99·6°. The bowels became constipated, and later became regular in their action. The patient then gradually and steadily improved, and was discharged well after fifty-six days in hospital. No plague bacilli were found in the blood on discharge. It is interesting to note that almost immediately after his discharge he contracted beri-beri, for which he was treated at the Tung Wah Hospital, and recovered.

(2) Chinese female, aged 27, suffering from bubonic plague. A well-nourished woman, has a left femoral bubo; is delirious. Pulse fairly strong. Was given injections as above described for four days successively, one injection each day. After the first injection purging set in—the motions were frequent, yellow and watery. This continued for two days. On the seventh day after admission a diffuse cellulitis set up over front of right upper arm, apparently originating from a bruise. The pulse became weaker, the delirium continued. Then purging of the same nature set in again and she died thirteen days after admission, and sixteen days after the incidence of plague. The *post-mortem* examination was interesting. The intestinal tract showed no pathological change, but the usual signs of plague presented themselves. It was noteworthy, however, that no plague bacilli were found in the heart blood, nor in the spleen, liver, bubo, or peripheral blood. They were found in the blood on admission, but were absent from the blood taken immediately before death.

(3) Chinese male, aged 30, was admitted suffering from bubonic plague. He was in a very low condition. Plague bacilli were found in the blood. An injection of mixed serum was given, one into the peritoneal cavity and a second full dose into the substance of the bubo. The next day purging set in—the motions being yellow and loose. This subsided in a day. A little tenderness over the abdomen quickly subsided, but a certain amount of œdema set in around the bubo. His condition seemed to improve a little, but he died on the fifth day after admission. At the *post-mortem* examination no plague bacilli were found in the bubo, spleen, liver, lungs, kidneys, or heart blood. It is worthy of note that no bacilli could be found in the peripheral blood examined immediately before death.

(*b*) *Treatment by Yersin's Serum alone.*—Thirty-two cases of bubonic plague and seven of septic were treated with Yersin's serum. An injection of 10 cc. was made subcutaneously, or into the bubo. The number of injections varied from one to four, as were considered necessary, in each case. The results were as follows:—

Bubonic plague: Recovered, M. 1, F. 5; died, M. 20, F. 6.

Septic plague: Recovered, M. 2, F. 0; died, M. 3, F. 2.

Total under treatment: Bubonic 32, septic 7.

Percentage of recoveries in bubonic cases, 19; in septic cases, 30.

It is difficult to estimate exactly what the effect was of the administration of the serum, owing to the fact that the reaction exhibited by the patient was not of a definite nature. It is a matter of fact there was no amelioration in any direction that would justify me in saying that the serum was to that extent effective. If the patient was delirious the delirium might continue or abate irrespectively of the serum. The effect on the temperature was equally uncertain, in some cases a reduction to the extent of a degree or so might occur, in others the temperature would rise; and so, too, was the effect on the circulatory system—

(To be continued in next Journal.)

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most uncertain. Locally, around the bubo, when the injection was made in that region, there appeared in some cases slight œdema. As regards its general effect viewed broadly, the marked constitutional and local amelioration which is seen in the case of the administration of diphtheria antitoxin was absent. The addition to the serum of an equal quantity of immune serum (serum from convalescent cases) seemed to produce one marked reaction, namely, a profuse diarrhœa. This was constant in the cases, and was always of the same nature. May this have been an effect on the part of the body to get rid of noxious principles? It will be interesting to watch its effects again under similar conditions. In one particular, however, the administration of Yersin's serum was most interesting. I noticed in some of the earliest cases that when plague bacilli were found in the blood in life, they were absent from the heart blood and tissues after death. In six cases of bubonic and one of septic plague in which the bacillus was readily demonstrated in life, it could not be found in any of the tissues after death—namely, the bubo, spleen, liver, lungs, kidneys and heart blood. In certain other cases—thirteen bubonic and one septic—examination after death revealed the presence of the bacillus in the bubo (in the bubonic cases) in varying numbers—in some swarming, in others numerous, in others a few—and in the same series none could be found in the heart blood in eight cases, none in the spleen in four cases, whilst in the remainder of these cases a few could be found in the spleen. In five bubonic cases the bacilli were numerous in all the organs and tissues after the injections. Thus we see that in nearly 17 per cent. of cases treated by Yersin's serum no bacilli could be found after death, in about 33 per cent. they were absent or appreciably diminished in numbers in the heart blood and spleen. On a consideration of these facts the question suggests itself—does the serum act as a bactericide or as a bacteriolytic agent? Is the absence, or the diminution in number, of the bacilli to be attributed to the action of the serum? I am aware that in estimating numbers in this manner objection may be taken on the ground that the method is not rigidly scientific. I grant that. It is, however, difficult, if not impossible, to reckon in any other way, and at all events whatever the error may be it is uniform. On the whole, I strongly incline to the opinion that the serum is effective in the direction of destroying the plague bacilli within the body, as their absence from the heart blood in about 50 per cent. of the cases shows. Why, then, does it not meet with more success when applied as a means of treatment? The reason probably is that cases of plague do not come under treatment early enough, are not, in point of fact, diagnose dearly enough. In consequence the poison is poured out rapidly from the bacteria and penetrating into the system closely and widely gets out of range of the serum, which is only a bactericide and not an antitoxin, and hence has very little effect, if any, upon the course of the disease. I think, however, that if the treatment of a case were to be undertaken sufficiently early, or, on the other hand, if the constitution of the serum could be suitably modified, the effect of its action would be probably more successful. Acting upon these ideas it is my intention to again use the serum when opportunity occurs. (It is right, I should add, that the serum which I used had been kept in the colony for some time, and that some of it came *via* Suez—two circumstances which may have combined to impair its efficiency to some extent.)

Reviewing the treatment of plague and considering as well other methods which have been applied from time to time, I fear it is impossible to avoid the conclusion that up to the present we have discovered nothing that is really effective, nothing that can rank as a specific in the same way as the diphtheria antitoxin. The use of carbolic acid in heroic doses was not conspicuously successful, and I consider we have sufficient grounds to revise the favourable impression which was formed of it the previous year. The only effective means of treatment we can adopt is to keep up the strength of the patient and at the same time watch the action of the heart and guard against its weakness and failure. Should we be able, by so doing, to tide over a sufficient period of time, the effect produced by the intensity of the poison will be reacted against and ultimately overcome by the formations of antitoxin in the blood, and then the system will be enabled to resist the infection and go on to recovery. Four cases of plague were admitted which had passed the critical stage of the disease without having been treated. They did not require much treatment in hospital beyond that which I have sketched above, and they ultimately recovered. Until we can discover an *anti*-body our treatment cannot be anything but expectant and symptomatic, and, above all, we should refrain from interfering with or thwarting the processes of Nature.

Thus, being impotent as regards treatment, it behoves us to be most careful in preventing the development and spread of plague. The consideration of the means is out of place in this report, but I might summarise concisely what is required to this end—elbow room, fresh air and sunlight.

Clinical Notes.

The Maturation of the Bubo.—I have found in some cases that when the bubo, if it was a solitary one, matured and opened spontaneously and discharged freely, the prognosis was much more favourable and the patient generally recovered. In three such cases I found no plague bacilli in the discharges (although they had been present in the blood), but there were crowds of staphylococci; in another case the pus was sterile. The plague bacilli in such cases seem to disappear, but whether this disappearance is caused by the local leucocytosis I am unable to say. At any rate, the discharging bubo seems to act as a sort of destructive agency for them, and as a consequence the active secretion of the poison must be proportionately modified. Acting upon this idea I endeavoured to imitate the process of Nature, and when suitable cases occurred the bubo was assiduously fomented with hot sublimate solution, and if it matured was opened. Two cases treated like this recovered, many

did not. It may be urged that it is only in mild cases that solitary buboes are present, for I found it convenient to treat in this manner only those cases in which solitary buboes were present; but the number of buboes is not always in proportion to the degree of infection, and as Nature has given the hint, it is worth working on those lines.

The Development of Pustules on the Sites of Bruises.—The following case is interesting as pointing to a possible means of spread of plague. The patient, a Chinese female, aged 35, was admitted in a very low condition. She had a left femoral bubo and tenderness over the left inguinal region. She had been under Chinese treatment and was pinched over the chest and arms, the sites being indicated by symmetrical bruises. There were also two patches of necrosis, one over the inferior angle of each scapula; these were about the size of a florin and were superficial. Whether these were caused in the process of Chinese treatment or whether they were of the nature of bedsores, I am unable to say. The interesting point is that plague bacilli were found in these two patches. On the site of the bruises small papules grew up, which gradually progressed until they became converted into pustules, and in these pustules plague bacilli were found in numbers. Eighteen days after admission the bubo was opened—no plague bacilli could be found in it. Eventually the patient recovered. The point of interest in this case is that one should note a possible means of spread of plague. Under native treatment counter-irritation is applied in cases of plague, and pustles may develop which may contain plague bacilli. These pustules may be ruptured, or they may dry, and crusts with plague bacilli be shed, as happens with dried sputum in tuberculosis, and thus acutely infectious material be wafted about. And there are in this colony sufficiently harmonious congenial surroundings for the growth and life of germs so conveyed.

Subcutaneous Hæmorrhages as a Means of Proprosis.—As is well known, hæmorrhages into organs and tissues are common in plague. They occur as well in the bubonic variety as in the septic. When hæmorrhages take place under the skin of the extremities they become visible as large patches, bluish-purple at first, then brownish-black, and are generally of unfavourable import. In two cases this occurred. The first was a well-nourished Indian police constable in good physical condition, suffering from septic plague. He was admitted on the third day of illness. The temperature kept up between 101° and 105°, fell to 98·8° on the sixth day, and rose again to 105° on the eighth day. At first the pulse was rapid and strong, then the rate fell with the fall of temperature, and later it became softer and dicrotic and weak. He became delirious, suddenly extensive hæmorrhage appeared under the skin of the ankles and elbows, and he died shortly after. The second case was a male, aged 33, suffering from bubonic plague. Large patches of hæmorrhage appeared on the anterior surface of legs and dorsum of feet, also on forearms and around elbows. In about three hours after, death ensued.

Small-pox Supervening on Plague.—The co-existence of two acute infectious diseases like small-pox and plague is noteworthy, and I give short notes of such a case. The patient, a Chinese male, aged 38, was admitted suffering from septic plague. It was the fourth day of the illness, and the usual signs of septic plague were present. The blood examination showed the presence of plague bacilli. Two days after a small papular rash appeared over the body, and the temperature went down to 101° from 102·8°. On the eighth day of illness small-pox was unmistakably developed, the rash becoming typically vesicular and confluent, and affecting the palate and fauces, as well as the palms and soles. He died the next day. He had not been vaccinated. The source of infection could not be traced. In view of the fact that a varioloid eruption has been stated to occur in some cases of plague, it is interesting to note that small-pox may undoubtedly supervene. An error in diagnosis may occur when such an eruption exists, but it can only simulate a mild attack of small-pox. When, however, other signs, all confirmatory, exist—as in this case—there can be no doubt. The course of the plague seemed to be altogether suppressed by the small-pox.

A Case of Plague Terminating in Bronchitis and Progressive Atrophy.—The following case is interesting as showing the depth of debility to which an attack of plague is able to reduce its victim, and the case with which other infective agents are able to obtain an effective foothold and breeding ground. The patient, a Chinese female, aged 17, was admitted on the sixth day of her illness suffering from bubonic plague. She had a right and a left femoral bubo, and plague bacilli in her blood. She was very weak, was delirious, her tongue was brownish and dry, and there were sordes about her teeth. There were two small pustules about $\frac{1}{3}$ to $\frac{1}{2}$ inch in diameter on the right leg, and a small ulcer behind the left knee; from there no plague bacilli could be isolated. Four days after she developed bronchitis. Examination of sputum showed no tubercle and no plague bacilli, the temperature remained persistently high, there was slight dulness in the right base, which quickly passed away. Repeated examinations of sputum showed no tubercle and no plague, and latterly there were no plague organisms in the blood. When this was ascertained to be the case she was transferred on the thirty-second day of her illness to the Tung Wah Hospital. She had three injections of Yersin's serum, and was taking iodide of iron and cod-liver oil. At the Tung Wah the evidence of bronchitis was persistent, and she lost ground steadily, becoming gradually more emaciated and weaker. She died about three months after she contracted plague.

The following is the report of the *post-mortem* examination: The body was extremely emaciated—I have never seen a more emaciated body. There was œdema of the lower extremities, and small bedsores over the trochanters and ischia. The heart was soft and flabby—fatty degeneration. Lungs: in both there was marked evidence of chronic bronchitis. There was slight evidence of tubercle, one or two nodules the size of a bean in the right apex in which tubercle bacilli were present. No pleurisy. About 4 ozs. of clear yellow fluid in each pleural cavity. The liver was diminished in size and weight—about 40 ozs.; it was very anæmic. There was fine cirrhosis and marked iron pigmentation. Gall-bladder was not dis-

tended, the bile was very thick. Spleen small in size, weight 4 ozs., capsule thickened; anæmic; diffuse amyloid; marked malarial pigmentation, but microscopically no parasites. Stomach and intestines normal. Mesenteric glands normal. Kidneys pale and fatty. Pelvic organs normal. Brain normal—glands all normal. No plague bacilli found. This case is interesting as demonstrating a condition of progressive atrophy combined with chronic bronchitis and malarial cachexia. The tubercular progress was not active.

The Formation of Fibrin in Plague Blood.—The blood of convalescent plague patients, as I observed in three cases, is very thin and watery. The percentage of hæmoglobin is diminished and the number of leucocytes increased. Fibrin formation is delayed. In ten instances which I observed it took almost five minutes to form. The percentage of fibrin seems lower than normal. These points, however, I was not able to investigate very thoroughly.

Report of the Superintendent of the Government Civil Hospital.

Dr. J. Bell, the Superintendent of the Government Civil Hospital, submits the annual report for 1904 on the work done in the Government Civil and Maternity Hospitals, with the usual statistical tables.

Police.

There were 707 admissions as against 759 in 1903, the strength being 935 as against 921, or 75·61 per cent. of the force were under treatment as compared with 82·41 per cent. in 1903 and 106·4 per cent. in 1902.

There were 12 Europeans, 89 Indians less and 49 Chinese more admitted as compared with last year. Average stay in hospital per man was 9·2 days.

Table I. gives the sick and mortality rate in percentage of strength for the last ten years.

The following table gives the admissions and deaths from the various sections of the force during the last ten years :—

Year	Europeans	Indians	Chinese	Total Admissions	Total Deaths
1895	90	254	116	466	8
1896	94	370	124	588	14
1897	99	320	107	526	7
1898	87	279	122	488	19
1899	117	421	154	692	16
1900	183	522	215	920	4
1901	202	521	214	937	8
1902	150	479	307	936	2
1903	130	431	198	759	5
1904	118	342	247	707	4

There were 4 deaths as compared with 5 in 1903 and 2 in 1902. Of these, 2 occurred amongst the European section, 1 amongst the Indian, and 1 amongst the Chinese. The causes of death were chronic Bright's (European), pernicious anæmia (Indian), phthisis (Chinese), and cerebral hæmorrhage (European).

There were 21 cases of invaliding—2 Europeans, 8 Indians, and 11 Chinese—the reasons for invaliding being chronic dysentery (1), cirrhosis of liver (1), chronic rheumatism (3), phthisis (3), paresis (1), anæmia (2), beri-beri (6), cardiac disease (2), dementia following head injury (1), debility (1).

Malaria.—One hundred and seven admissions as against 167 in 1903, or 11·55 per cent. of the force were attacked as against 18·13 per cent. The European section suffered to the extent of 7·87 per cent., the Indian 20 per cent., and the Chinese 5·73 per cent.

These figures show a marked decrease and it may be interesting to note that this decrease has been steadily maintained for the last five years. The percentages are as follows : 1900=45·03, 1901=44·69, 1902=19·97, 1903=18·13, and 1904=11·55.

None of the Europeans were in more than once for this illness. Of the Indians 2·81 per cent. had two attacks, 0·28 per cent. three, and 0·28 per cent. four attacks. Three Chinese (0·66 per cent.) had two admittances, and 2 (0·44 per cent.) had three.

The question of relapse in malaria is an interesting one, but not easy to settle in the Tropics, as it is impossible to eliminate the chances of a fresh infection in any particular case, and one's theories regarding the subject can only be speculative. Apart from "crescents," which do not occur in all cases, and which sooner or later die out, no latent form has been discovered *post mortem* to account for the relapse. The fact that out of 127 Europeans none have been in more than once is worth noting. The bulk of the repeat cases (11 out of 17) were from the same station, and only 6 came from different stations. Thirteen came in each time with the same form of malaria and 4 with different forms. The Indian with four attacks came in first with malignant, next with simple tertian, again with malignant, and finally with simple tertian, at intervals of almost exactly a month. The other three with different forms of malaria had first malignant attacks, followed by simple tertian and quartan respectively. These 4 cases must be eliminated from the list of "relapses," as the disease breeds true, so that the number is small out of such a large force. Only 6 cases showed crescents in their blood on admission, and of these only 2 were in twice at intervals of a month and two months respectively.

The following table gives the admissions compared to strength for the more important stations of the New Territory for the past four years :—

	1901.	1902.	1903.	1904.
Sha Tau Kok	30·7	...	15·38	13·3
Ping Shan ...	64·2	7·1	45·45	13·3
Sai Kung ...	28·2	16·6	16·6	50·0
San Tin ...	25·0	...	...	10·0
Tai Po ...	70·0	50·0	33·3	27·2
Tai O... ...	10·0	10·0	11·1	10·0
Sha Tin ...	25·0	...	12·5	33·3
Au Tau ...	121·4	7·6	61·5	50·0
Sheung Shui...	63·6	20·0	9·0	—

This shows a decrease in all stations but three—Sai Kung, San Tin and Sha Tin.

The average number of days spent by each man in hospital for this disease was 5·7 against 7·9 last year.

Phthisis.—Four cases were under treatment as against 13 last year. One died and the others were invalided. Two cases occurred amongst the Indians and 2 amongst the Chinese.

Dysentery.—Twenty-eight cases were under treatment as against 13, a large increase. Of these, 8 were Europeans, 18 Indians, and 2 Chinese.

Beri-beri.—Twenty-three cases, all amongst the Chinese section, as against 9 last year. We are still quite ignorant as to the cause of this peculiar malady, and hospital investigations throw no further light on the subject. None of the cases came from the New Territory or out-stations, the stations responsible being Central (14 cases), Water (4 cases), No. 7 (3 cases), and No. 2 (2 cases).

Typhoid Fever.—No cases of this disease occurred.

The various other ailments call for no special observations.

Table II. gives the admissions and deaths during each month of the year.

Table III. gives the admissions for malaria from each station. Exclusive of certain New Territory stations already dealt with, there is a *decrease* in all stations but four, viz., Mount Gough, Tsat Ttze Mui, Tsim Tsat Tsoi and Sham Sui Po.

Gaol Staff.

There were 73 admissions out of a staff of 125, or 58·4 per cent. against 82·79 in 1903. There were no deaths, but two Indians were invalided—one for phthisis and one for cirrhosis of liver. During the dysentery epidemic in June and July the Indian staff suffered somewhat, 3 and 6 cases being admitted out of 12 and 26 for all causes.

Sanitary Department.

There were 29 admissions as against 34 in 1903. There were no deaths and no invaliding.

Government Civil Hospital.

The total number of admissions was 2,585 as against 2,794 in 1903. The decrease is accounted for owing to its being necessary throughout the year to close one ward for repairs.

The total number of out-patients was 13,706 as against 11,911.

Attached are the following tables :—

Table IV.—Showing admissions and deaths in the hospital during each month.
,, V.—Showing operations performed.
,, VI.—Showing admissions and deaths under respective diseases.
,, VII.—Showing admissions and deaths in the Maternity Hospital.
,, VIII.—Showing varieties of malarial met with during the year.

The following table gives the number and class of patients admitted during the last ten years :—

Year	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904
Police	466	588	529	488	692	920	937	938	759	707
Paying patients	498	632	603	741	764	891	830	931	777	772
Government servants	203	269	227	186	208	266	339	460	319	267
Police cases	319	244	299	306	306	347	348	300	276	262
Free	668	778	742	785	739	569	466	454	646	555
Board of trade	129	87	45	65	25	37	28	25	17	22
Total	2,283	2,598	2,445	2,571	2,734	3,030	2,948	3,108	2,794	2,585

This shows, as compared with last year, a decrease in the number of patients admitted under all headings but Board of Trade.

The admissions and deaths for the last ten years are as follows :—

Year.	Admissions.	Deaths.
1895	2,283	114
1896	2,598	143
1897	2,445	119
1898	2,571	138
1899	2,734	114
1900	3,030	155
1901	2,948	153
1902	3,108	140
1903	2,794	142
1904	2,585	128

Of the 128 fatal cases 31 were moribund on admission and died within twenty-four hours.

The rate of mortality for the year was 4·9 per cent. as against 5·08 last year. The average daily number of sick was 93·94 as against 99·09.

Women and Children.—The number admitted was 238 as against 295. The death-rate was 9·2.

Nationality.

Europeans.—784 were admitted as against 802.

Indians and Coloured.—644 were admitted as against 748.

Asiatics (Chinese and Japanese).—1,157 were admitted as against 1,244.

Only 3 officers of the garrison were under treatment as against 6 last year.

(To be continued in next Journal.)

Colonial Medical Reports—No. 11—HONG KONG *(continued).*

DISEASES.

The following diseases caused the greatest number of admissions:—

Fevers—	
Malarial	221
Febricula	128
Typhoid	42
Dengue	43
Venereal disease...	141
Disease of respiratory system	230
,, digestive system	257
Dysentery	106
Beri-beri	70
Rheumatism	73
Injuries	473
Alcoholism	57

The following diseases caused the greatest number of deaths:—

Diseases of respiratory system... ...	27
Injuries	31
Typhoid fever	9
Beri-beri	8
Dysentery	6

Dengue Fever.—Only 43 cases were under treatment as against 123 in 1903 and 422 in 1902, so evidently the disease is dying out. Almost all the cases occurred in October and November. Various endeavours were made to ascertain the cause but without success.

Malarial Fever.—Two hundred and twenty-one cases against 346 in 1902 and 787 in 1901, so it would appear as if this disease were also on the wane. Two deaths occurred as the result of the disease, both being of the "coma" form. The varieties of malaria met with were:—

Malignant	77·7 per cent.
Simple tertian	14·1 ,,
Quartan	1·7 ,,
Mixed infection	6·4 ,,

The diseases associated with malaria were:—

Dysentery	8 cases.
Beri-beri	2 ,,
Dengue fever	2 ,,
Peripheral neuritis	1 case
Bright's disease	1 ,,
Injuries	1 ,,

There were very few bad "crescent" cases, so that no very systematic trial of drugs against this form could be carried out. Neither iron nor carbolic acid in large doses seem to have any effect. Of those under treatment, 26·8 per cent. were Europeans, 46·7 Indians, 24·2 Chinese, and 2·1 Japanese.

Typhoid Fever.—Forty-two cases with 9 deaths against 28 with 6 deaths last year. The death-rate was 21·4 per cent. None of the cases had a relapse. Of the number treated, 21 were imported, Europeans accounted for 17, Japanese 12, Chinese 8, and Indians 5 cases. The increase amongst the Chinese is worthy of note. There is nothing to say about the treatment, which is purely one of nursing and treating symptoms. As far as our experience goes, no drug is of the least use. Carbolic acid and cyllin were both tried but without reducing the fever in the least, and in several cases upsetting the patients' feeding powers—a serious matter. Cyllin especially they would not take, as "it repeats so much," and this I found to be the case by practical experience. Possibly if coated in a different manner it might be of some use, as theoretically an intestinal antiseptic would be an ideal drug. The difficulty seems to be to find one of any use. B. naphthol and lactic acid were also used. Three cases with rare complications are inserted in the Appendix. Two cases had "green, spinach-like" stools shortly before death. This may be a sign of serious import, though it is not mentioned by the authorities. "Widal's reaction" was sought for in all cases, but it was just as often positive as negative and it is of no use clinically.

Plague.—Only 5 cases came under our notice, 3 of which died before they could be transferred to the Infectious Diseases Hospital.

Phthisis.—Fifty-five cases were under treatment as against 60 last year. Of these, 14 were fatal. There were 14 cases amongst Europeans, 21 amongst Indians, 14 amongst Chinese and 6 amongst Japanese. There is little to say of this serious disease and nothing in regard to treatment. Cyllin was tried internally without the slightest benefit. We have had two or three cases of apparent cures. One, an Indian gaol guard, whilst in hospital lost his fever and cough and the tubercle bacilli disappeared entirely from his sputum, but he returned in two months' time as bad as ever and was invalided. Another, an Indian policeman, came in for severe hæmoptysis with fever and tubercle bacilli in his sputum. He lost all his symptoms completely, but had to be invalided in three months' time for the disease. The third, a European, was admitted as a case of "liver abscess." He had fever, cough, hæmoptysis and a swelling over the left lobe of the liver resembling an abscess. His sputum was full of tubercle bacilli. All his symptoms completely disappeared, and when he was readmitted five months' later for venereal disease he was in perfect health and still continues so. No special treatment was adopted in any of these cases, or it might have been credited with the cure.

Febricula.—One hundred and twenty-eight cases against 96. Every endeavour is made to keep down this list, a refuge when all other causes of fever have been excluded. No doubt a few may be malarial, where owing to the administration of quinine before arrival in hospital the parasities have disappeared from the blood. There are two causes of mild feverish attacks which I have noticed and which I do not think sufficient stress is laid upon, viz., syphilis and constipation. I have now collected a fair number of irregular fevers, occurring in young adults, without any definite symptoms, in which as soon as an anti-syphilitic course of treatment is adopted the fever at once subsides. We have also had several cases in which as a result of chronic constipation a species of auto-intoxication has set in, and after free and thorough purging all symptoms have subsided. These cases present in addition to the temperature a furred

tongue, general malaise, and in some cases complain of general abdominal discomfort or pain in right iliac fossa; in fact, one or two have been sent in as cases of appendicitis. A weekly or bi-weekly action of the bowels being a habit with them, they are surprised when told they are constipated, and still more so when their bowels are opened two or three times daily.

Dysentery.—One hundred and six cases with 6 deaths against 50 cases last year—a serious increase which requires consideration. Of this number, 45 were Europeans, 44 Indians, 13 Chinese, and 4 Japanese.

Whatever be the actual cause in each particular case, there is no doubt that this disease must be classed in the "typhoid" group, *i.e.*, a disease almost solely spread by contaminated water or uncooked vegetables, especially when the latter are watered as they are in this part of the world. It is also significant that the number in which no microscopic cause could be ascertained, and which are placed in the bacillary group, have risen very considerably. Using a continuous water supply as an intermittent one is no doubt responsible for some of the spread of these water-borne diseases, as the vacuum in the pipes at times must be greater than any valve will stand, and so dirt and germs must get drawn into the pipes. The storage of water in all sorts of receptacles and places is probably even more responsible, and lastly, the system of manuring vegetables as employed in this country is not only disgusting but extremely dangerous to health, not only giving rise to serious illnesses, but to a good many minor ailments which are at least unpleasant.

Several of the cases have been very serious ones, necessitating the patients leaving the Tropics for good, or for a considerable time. Two cases were interesting, as from them the incubation period of the disease may be inferred, a somewhat difficult matter in tropical diseases. Both were on their way out from home and were on shore for the first time at Singapore. Forty-eight hours after, at sea, they were attacked with typical dysentery. One, I regret to say, died shortly after admission. The cases were presumably of the bacillary type. The Japanese referred to in last year's report (p. 16) as having amœbæ and ankylostoma eggs in his stool again came in with dysentery and was extremely ill, but nothing was found in his stools. I found that occasionally when magnesium sulphate failed to cure, the substitution of the soda salt proved of immediate benefit.

Divided into apparent causes the cases are as follows:—

(1)	23	cases with	*Amœbæ coli.*
(2)	2	,, ,,	*Cercomonas intestinale.*
(3)	2	,, ,,	*Distoma crassum* eggs.
(4)	8	,, ,,	malarial parasites in the blood.
(5)	71	,, ,,	nothing to be found in stool or blood.

Diphtheria.—Only one case, a Chinese child, was under treatment. The antidiphtheritic serum was used, but the child died from heart failure rather suddenly.

Pernicious Anæmia.—Two cases of this somewhat rare disease here were under treatment. One recovered sufficiently to leave for his home in India, but the other, a policeman, succumbed rapidly.

Hepatic Abscess.—Only one case was under treatment, with a successful result, and the case is published in the Appendix. With the large increase in the number of dysentery cases one would expect more if the theory had anything in it that one was the cause of the other.

Appendicitis.—Three cases were under treatment. Two recovered without surgical interference, and the other after the usual operation was discharged well.

Poisons.—Only one case was under treatment, and that due to lead. The patient, a Chinese storekeeper, recovered after a somewhat prolonged stay in hospital.

Fractures.—The following were treated during the year:—

Femur	5 cases.
Arm	3 ,,
Forearm	6 ,,
Leg	11 ,,
Skull (with 13 deaths)	14 ,,
Patella	1 case.
Scapula	1 ,,
Clavicle	1 ,,
Ribs	1 ,,
Fingers	1 ,,

Dislocations.—The following were under treatment:—

Thigh	1 case.
Shoulder	1 ,,
Elbow	1 ,,
Clavicle	1 ,,

Operations.—There were 283 operations performed during the year. Amongst the more important were:—

Liver Abscess.—Already mentioned.

Amputation through Shoulder-joint.—This was done for injury and was successful.

Ovarian Tumour.—This case occurred in a young Chinese. The patient never rallied from the shock of the operation and died shortly after.

Abdominal Section.—Six cases, all, I regret to say, fatal. They were done for ruptured intestine, intussusception in an adult Japanese, purulent peritonitis, the result of malignant disease of the rectum, and three exploratory. These latter were cases of retro-peritoneal hæmorrhage and a ruptured spleen.

Wound of Abdomen.—Three cases with protrusion of intestines. They all did well.

Extrauterine Fœtation.—This case recovered rapidly. The case being of interest is inserted in the Appendix.

Anæsthetics.—Chloroform was administered 185 times without any fatal result, all by the open method. Local anæsthesia was employed in 29 other cases, cocaine and eucaine alone or with adrenalin chloride and ethyl chloride being used.

Vaccinations.—The following were performed:—

	Successful.	Unsuccessful.	Total.
Primary cases ...	213 ...	0 ...	213
Revaccinations ...	311 ...	115 ...	426
			639

Radiography.—The new apparatus has worked well and been of great use throughout the year. Our best thanks are due to Dr. Jordan for kindly keeping our batteries charged.

Maternity Hospital.

Seventy-two cases were under treatment, the highest yet on record. Owing to lack of space one case was treated in the general ward of the Government Civil Hospital and another was sent to Victoria Hospital. Of this number 47 were paying patients, 13 wives of Government servants, and 12 free. Of the births, 24 were boys and 34 girls. The two fatal cases occurred in Chinese—one suffering from advanced interstitial nephritis, and the other from placenta prævia admitted in a moribund condition.

Fees.—The total fees received in this department were :—

Hospital fees	$33,498 34
Certificates	770 00
Total	$34,268 34

Table I.

Showing the Sick Rate and Mortality Rate in the Different Sections of the Police for the last Ten Years.

Year	Europeans		Indians		Chinese	
	Sick Rate	Mortality Rate	Sick Rate	Mortality Rate	Sick Rate	Mortality Rate
1895	85·91	0·89	112·89	0·44	40·00	2·07
1896	89·52	0·95	172·89	1·40	40·52	3·26
1897	94·28	0·95	146·11	1·37	35·54	0·99
1898	77·67	3·57	123·45	1·32	41·78	4·10
1899	104·46	3·57	151·98	1·08	47·09	2·75
1900	135·50	..	147·40	0·57	57·02	0·40
1901	160·31	3·17	147·17	0·56	52·97	0·49
1902	126·00	0·84	131·90	0·80	76·90	..
1903	115·04	..	124·56	0·57	54·69	0·82
1904	92·91	1·57	96·33	0·28	54·52	0·22

Table II.

Admissions into and Deaths in the Government Civil Hospital, from the Police Force, during each Month of the Year 1904.

Months	Europeans		Indians		Chinese		Total Admissions	Deaths
	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths		
Remaining on December 31st, 1903	2	..	7	..	3	..	12	..
January	6	..	17	..	22	..	45	..
February	8	..	22	..	14	..	43	..
March	10	..	16	..	12	..	38	..
April	14	1	24	..	14	..	52	1
May	9	..	43	..	21	..	73	..
June	5	..	26	..	35	..	66	..
July	6	..	37	..	32	1	75	1
August	11	..	33	..	25	..	69	..
September	9	..	34	1	14	..	57	1
October	19	..	25	..	25	..	69	..
November	12	1	35	..	12	..	59	1
December	7	..	23	..	18	..	48	..
Total	118	2	342	1	247	1	707	4

Table III.

The Monthly Admissions for Malarial Fever from each Police Station during the Year 1904.

Stations	Average Strength	January	February	March	April	May	June	July	August	September	October	November	December	Total	Percentage to Strength
Central	320	3	2	..	2	3	3	2	5	1	1	4	4	30	9·37
No. 1	11	..	..	..	..	..	..	..	..	..	..	..	..	..	..
No. 2	37	..	..	..	..	..	..	1	1	1	1	2	..	6	16·21
No. 3	9	..	..	..	..	..	..	..	..	..	..	..	..	..	..
No. 5	11	..	..	..	..	..	..	..	..	..	..	..	..	..	..
No. 6 (Gap) ..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
No. 7	67	..	..	..	..	1	1	..	..	..	1	1	..	4	5·97
No. 8	25	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mount Gough ..	20	..	..	..	..	..	..	1	..	..	..	..	..	1	5·00
Tsat Tse Mui ..	7	..	..	..	..	..	1	2	3	2	1	..	1	10	142·85
Shaukiwan ..	13	..	..	..	..	..	..	..	..	..	1	..	..	1	7·68
Quarry Bay ..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Stanley	11	..	..	..	..	..	1	4	4	..	3	..	2	14	127·27
Aberdeen	16	..	1	..	..	1	1	2	..	..	1	..	1	7	43·75
Pokfulam	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Kennedy Town ..	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cheung Chau ..	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lamma Island ..	5	..	..	..	..	1	..	..	..	..	..	..	..	1	20·00
Water	150	..	..	..	..	..	..	1	..	..	..	..	..	1	0·66
Yaumati	33	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tsim Tsat Tsui ..	18	1	..	..	1	..	..	..	..	..	..	..	..	2	11·11
Sam Shui Po ..	14	..	..	..	..	..	..	..	..	1	..	1	..	2	14·28
Hunghom ..	17	..	..	..	..	..	..	..	..	..	..	1	..	1	5·88
Kowloon City ..	16	..	..	..	..	..	..	..	..	..	..	1	..	1	6·25
Tung Ching ..	7	..	..	..	..	2	..	..	2	..	..	..	..	4	57·14
Sai Kung	6	..	..	..	..	..	..	..	..	2	..	1	..	3	50·00
San Tin	10	..	..	..	..	..	..	1	..	..	..	..	..	1	10·00
Tai O	10	..	..	..	..	..	..	..	..	1	..	..	..	1	10·00
Sha Tin	6	..	..	..	..	..	..	2	..	..	..	..	..	2	33·30
Sha Tin Gap ..	3	..	..	..	..	..	..	..	1	..	..	..	..	1	33·33
Tai Po	11	..	..	..	..	..	..	..	..	1	..	1	1	3	27·20
Au Tau	14	..	..	..	1	1	2	1	..	..	1	1	..	7	50·00
Sheung Shui ..	12	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sha Ta kok ..	15	..	..	..	..	..	..	..	..	..	..	2	..	2	13·30
Ping Shan	15	..	..	..	..	..	..	..	..	..	..	2	..	2	13·30
Total	..	4	3	..	4	9	9	17	16	9	10	17	9	107	

Table IV.

Admissions into and Deaths in the Government Civil Hospital during each Month of the Year 1904.

Months	Europeans		Indians		Asiatics		Total Admissions	Total Deaths
	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths		
Remaining on January 31st, 1903	22	..	19	2	37	..	78	2
January	64	5	29	1	96	1	189	7
February	65	3	32	..	66	5	163	8
March	55	2	27	2	71	3	153	7
April	68	2	50	1	86	5	204	8
May	55	2	59	2	101	7	215	11
June	45	..	56	5	111	10	212	15
July	77	..	81	4	98	10	256	14
August	69	2	63	3	107	7	239	12
September	61	2	68	1	86	6	215	9
October	82	2	57	3	104	11	243	16
November	69	4	61	1	103	8	233	13
December	52	..	42	1	91	5	185	6
Total	784	24	654	26	1,157	78	2,585	128
Death-rate ..	3·06		4·03		6·74			

(To be continued in next Journal.)

Colonial Medical Reports, No. 11.—Hong Kong (*continued*).

TABLE V.

LIST OF OPERATIONS PERFORMED IN 1904.

Surgical Operation.	Number.	Deaths.
Operations on Organs of Locomotion :—		
Amputation of thigh	1	1
,, ,, leg	6	1
,, ,, toes	8	..
,, ,, arm	7	2
,, ,, forearm	1	1
,, ,, forearm (both in same patient)	1	1
,, ,, hand	2	...
,, ,, fingers	3	...
Suppurating bursa	1	...
Breaking down adhesions in knee-joint	1	...
Suturing tendons	1	...
Removal of Tumours :—		
Buboes incised	31	...
Buboes scraped or removed	18	...
Ovarian tumour	1	1
Keloid growth	1	...
Sarcoma (arm)	2	...
Cysts	5	...
Carbuncle	1	...
Eye operations :—		
Cataract	2	...
Pterygium	1	...
Trichiasis	1	...
Iridectomy	1	1
Trachoma	1	...
Operations on Genito-urinary system :—		
Hydrocele tapped	2	...
,, radical cure	7	..
Circumcision	22	..
Ruptured urethra	1	...
Stricture of urethra	5	...
Hernia testis	1	...
Phimosis	1	...
Operations on Digestive System :—		
Hernia (strangulated)	1	1
Hepatic abscess	2	...
Hæmorrhoids	6	...
Exploring liver	2	...
Fistula in ano	5	...
Paracentesis abdominalis	4	...
Abdominal section (exploratory)	3	3
,, ,, (ruptured intestine)	1	1
,, ,, (purulent peritonitis)	1	1
,, ,, (intussusception)	1	1
Appendicitis	1	...
Carried forward	163	14
Brought forward	163	14
Wounds of thigh	1	...
,, ,, leg	2	...
,, ,, arm	3	...
,, ,, chest	2	...
,, ,, abdomen	2	...
,, ,, scrotum	1	...
,, ,, hand	1	...
,, ,, skull (trephining)	3	3
General Abscesses :—		
Abscess of lumbar region	1	...
,, breast	1	...
,, thigh	1	...
,, leg	1	...
,, scrotum	5	...
,, neck	13	...
,, perinæum	1	...
,, arm	4	...
,, scalp	4	...
,, orbit	1	...
,, iliac	1	...
,, foot	6	...
,, hand	9	...
,, buttock	2	...
,, ischio-rectal	6	...
,, axilla	1	...
,, cheek	2	...
,, jaw	4	...
,, lachrymal	1	...
General operations :—		
Necrosis	8	...
Cellulitis	1	...
Sloughing phagædena	10	...
Sinus	6	...
Resection	1	...
Excision of spleen	1	1
Needle in hand (removal of)	1	...
Paracentesis thoracis	1	...
Parturition :—		
Placenta Prævia	1	1
Forceps	6	1
Adherent placenta	1	...
Extrauterine fœtation	1	...
Retained placenta	1	...
Curetting uterus	2	...
Total	283	20

TABLE VII.

ADMISSIONS INTO AND DEATHS IN THE GOVERNMENT MATERNITY HOSPITAL DURING EACH MONTH OF 1904.

Months.	Europeans		Chinese		Japanese		Total	
	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths
January	6	...	...	...	...	...	6	...
February	3	...	2	...	1	...	6	...
March	...	...	1	...	...	...	1	..
April	2	...	1	...	...	...	3	...
May	1	...	10	...	1	...	12	...
June	3	...	1	...	...	...	4	...
July	4	...	2	1	1	...	7	1
August	6	...	...	...	1	...	7	..
September	4	...	1	1	...	...	5	1
October	3	...	1	...	3	...	7	...
November	...	...	6	...	3	...	9	...
December	3	...	1	...	1	...	5	...
Total	35	...	26	2	11	...	72	2

RETURN OF DISEASES AND DEATHS IN 1904 AT THE

Government Civil Hospital, and Victoria Hospital, Hong Kong.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	57	—	57
Anæmia	11	1	11
Anthrax	—	—	—
Beri-beri	70	8	70
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	—	—	—
Cholera	1	1	1
Choleraic Diarrhœa	—	—	—
Congenital Malformation	3	—	3
Debility	73	9	73
Delirium Tremens	—	—	—
Dengue	45	—	45
Diabetes Mellitus	1	—	1
Diabetes Insipidus	1	—	1
Diphtheria	3	1	3
Dysentery	113	6	113
Enteric Fever	45	10	45
Erysipelas	1	—	1
Febricula	130	—	130
Filariasis	—	—	—
Gonorrhœa	61	—	61
Gout	3	—	3
Hydrophobia	—	—	—
Influenza	—	—	—
Kala-Azar	—	—	—
Leprosy	—	—	—
(*a*) Nodular	—	—	—
(*b*) Anæsthetic	—	—	—
(*c*) Mixed	—	—	—
Malarial Fever—	226	2	226
(*a*) Intermittent—	—	—	—
Quotidian	—	—	—
Tertian	—	—	—
Quartan	—	—	—
Irregular	—	—	—
Type undiagnosed	—	—	—
(*b*) Remittent	—	—	—
(*c*) Pernicious	—	—	—
(*d*) Malarial Cachexia	1	—	1
Malta Fever	—	—	—
Measles	4	—	4
Mumps	3	—	3
New Growths—			
Non-malignant	8	—	8
Malignant	7	2	7
Old Age	—	—	—
Other Diseases	—	—	—
Pellagra	—	—	—
Plague	5	3	5
Pyæmia	—	—	—
Rachitis	—	—	—
Rheumatic Fever	1	—	1
Rheumatism	74	—	74
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	—	—	—
Septicæmia	3	2	3
Sleeping Sickness	—	—	—
Sloughing Phagedæna	5	—	5
Small-pox	3	—	3
Syphilis—			
(*a*) Primary	18	—	18
(*b*) Secondary	61	—	61
(*c*) Tertiary	—	—	—
(*d*) Congenital	2	—	2
Tetanus	—	—	—
Trypanosoma Fever	—	—	—
Tubercle—	—	—	—
(*a*) Phthisis Pulmonalis	—	—	—
(*b*) Tuberculosis of Glands	3	—	3
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculous Disease of Bones	—	—	—
GENERAL DISEASES—*continued.*			
Other Tubercular Diseases	—	—	—
Varicella	—	—	—
Whooping Cough	4	—	4
Yaws	—	—	—
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	67	—	67
Circulatory System—	27	4	27
(*a*) Valvular Disease of Heart	—	—	—
(*b*) Other Diseases	—	—	—
Digestive System—	275	4	275
(*a*) Diarrhœa	—	—	—
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	—	—	—
Congestion of Liver	—	—	—
(*d*) Abscess of Liver	—	—	—
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	—	—	—
(*g*) Cirrhosis of Liver	—	—	—
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	—	—	—
Ear	11	—	11
Eye	79	—	79
Generative System—			
Male Organs	79	—	79
Female Organs	19	1	19
Lymphatic System	60	—	60
Nervous System	59	7	59
Nose	—	—	—
Organs of Locomotion	63	—	63
Respiratory System	242	29	242
Skin—	40	—	40
(*a*) Scabies	—	—	—
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	—	—	—
(*f*) Other Diseases	—	—	—
Urinary System	29	8	29
Injuries, General, Local—			
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	23	2	23
(*c*) Other Injuries	475	31	475
Parasites—	18	2	18
Ascaris lumbricoides	—	—	—
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	—	—	—
Tape-worm	—	—	—
Poisons—			
Snake-bites	—	—	—
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	—	—	—
Surgical Operations—			
Amputations, Major	—	—	—
,, Minor	—	—	—
Other Operations	—	—	—
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

TABLE VIII.

VARIETIES OF MALARIAL FEVERS OCCURRING MONTHLY AT GOVERNMENT CIVIL HOSPITAL DURING 1904.

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Quartan	1	...	...	...	...	...	...	...	1	1	1	...	4
Simple tertian	...	1	1	...	1	2	3	6	4	10	3	2	33
Malignant	4	4	...	4	9	13	30	26	30	19	31	12	182
Mixed infections	2	...	...	2	..	2	4	2	..	1	2	...	15
Total ...	7	5	1	6	10	17	37	34	35	31	37	14	234
Percentage to cases admitted	2·62	3·06	0·65	2·94	4·65	8·01	14·45	14·22	16·20	12·75	15·87	7·56	9·05

METEOROLOGICAL RETURN FOR YEAR 1904.

Month	Barometer at M.S.L.	Temperature			Humidity		Cloudiness	Sunshine	Rain	Wind	
		Max.	Mean	Min.	Re	Abs.				Vel.	Dir.
January	30·20	64·9	59·5	55·4	72	0·37	49	185·2	0·120	13·8	E by N
February	30·12	68·1	62·6	58·5	69	0·40	37	207·5	0·200	13·9	E
March	30·00	67·0	63·2	60·3	87	0·51	97	29·7	3·755	14·6	E by N
April	29·96	75·2	70·7	67·8	86	0·65	83	112·4	1·905	14·8	E
May	29·88	80·8	75·6	71·8	83	0·74	73	148·0	7·705	12·8	E by S
June	29·72	85·0	79·8	76·0	83	0·84	72	162·1	19·640	9·9	SE by E
July	29·67	85·9	81·1	77·9	82	0·88	76	147·4	7·225	10·9	SSW
August	29·70	86·0	80·8	77·2	83	0·87	68	172·6	27·640	13·2	E by S
September	29·88	85·0	80·2	76·3	81	0·84	66	161·3	9·770	11·5	E
October...	30·01	80·1	76·5	73.3	74	0·68	58	191·2	2·005	14·1	E by N
November	30·15	74·0	68·8	64·6	62	0·45	55	187·3	0·215	13·1	ENE
December	30·23	66·1	60·7	55·7	62	0·34	45	201·7	0·230	10·6	ENE

APPENDIX.

RUPTURED TUBAL PREGNANCY. OPERATION. RECOVERY.

A Chinese, aged 27, was admitted to hospital on May 25th, 1904, having been seen three hours previously by Dr. Jordan, who, on the above diagnosis, advised her immediate removal with a view to operation.

On admission patient was very blanched, with a quick-running pulse (156) and complaining of great abdominal pain. The operation was at once proceeded with, Dr. Koch kindly giving chloroform. The abdomen was opened in the middle line and blood and blood clot rapidly cleared out. A fœtus, between fourth and fifth month, was found. The pregnancy had occurred in the right tube close to its entrance into the uterine cavity. The placenta was growing on the uterus. The peritoneal covering around this was incised and the whole sliced off, opening the uterine cavity by a hole which admitted the tip of the little finger. This was closed with six thick silk sutures and the abdominal cavity washed out with saline fluid and closed with silk.

For forty-eight hours the patient's condition was very critical, requiring close nursing and constant stimulation (strychnia, camphor, &c.). The temperature rose on the fifth day to 105°. And the os was then dilated, giving exit to a decidual membrane, which at once reduced the temperature. The abdominal incision healed without any trouble and the patient was discharged on June 13th quite well.

Remarks.—The rate of mortality for this operation being so high, successful cases are worth reporting. It is extremely fortunate for this patient that her husband had the good sense to send for a medical man and to follow his advice. The treatment and the special condition met with are also somewhat out of the ordinary. None of the books at our disposal mention the possibility of the placenta being attached to the uterus, nor what should be the line of treatment under this condition.

TYPHOID FEVER WITH COMPLICATIONS. RECOVERY.

Two Cases with Jaundice and Glycosuria.

(1) European male, aged 32, admitted with fever. Patient was very ill, dry tongue, great restlessness and very tremulous, having been drinking heavily. Jaundice was well marked and the urine, on examination, showed a trace of albumen and sugar (gr. i. to ʒj.). This patient had a very severe attack indeed, being delirious for days, great abdominal distensions, passing his motions in bed and several severe hæmorrhages from the bowel. Jaundice disappeared on the twenty-second day, and the sugar on the seventeenth. His temperature fell to normal on the eighteenth day,

was intermittent for another three days before finally keeping normal. He was seventy-four days in hospital and lost considerably in weight.

(2) Japanese adult, aged 37, was admitted on the eighth day of the fever with a dry, furred tongue, well-marked jaundice, liquid yellow stools and delirium. His urine showed a trace of albumen and sugar (gr. i. to ʒj.). The delirium persisted to the twenty-fifth day. Widal's reaction was positive on the eighteenth day. The jaundice persisted up to the twenty-second and the sugar to the twentieth day.

The temperature was normal on the sixteenth day, and then intermittent up to the fortieth, when he had an alarming hæmorrhage from the bowel and finally remained normal on the fifty-fifth day. The patient spent sixty-three days in hospital.

Remarks. — Both these complications are rare. "Sugar is rarely found in the urine" (Brannan, "Twentieth Century of Medicine"). "Jaundice is a symptom of extreme rarity" (*idem*). Murchison only met with three cases, all fatal. Both of the above cases were extremely ill and tested the nursing to the utmost. The treatment throughout was symptomatic only.

A Case with Acute Dysentery.

A French sailor from Saigon was admitted on July 5th, 1904, with a history of twelve days' fever of a remittent type, accompanied by diarrhœa, furred tongue and general malaise. The fever fell to normal on the twenty-seventh day, and the following day the diarrhœa increased in frequency, the stools being full of bloody mucus with amœbæ. The patient was treated with salines and chloride of calcium, but as the condition did not improve much a daily enema of ipecacuanha ʒij. was given as well. The dysentery was, however, very obstinate to treatment and naturally made the convalescence slow and tedious. The patient eventually recovered and left for France on September 6th.

Remarks. — This association is somewhat rare, though it has been mentioned by various observers. No doubt the double infection was acquired at the same time and the incubation period of the dysentery prolonged by the typhoid infection.

Acute Glossitis following Tonsillitis.

A European female, aged 28, was admitted to hospital on May 20th. She had been under treatment for three days previously for acute tonsillitis with high fever (104°). The day before the temperature fell to normal and swallowing was fairly easy. On the morning of the 20th she first complained of the increased size of her tongue and swallowing again became troublesome. Free incisions were made in the tongue by her medical attendant (Dr. Rennie) and her removal to hospital advised in case further interference should be necessary. On admission her temperature was 101°, the tongue was very foul and much enlarged, protruding from the mouth for about one inch, and the patient was quite unable to talk. Four grs. of calomel were at once given and four-hourly mixture containing V. aconiti ɱii. and liq. ammon. acetat. ʒij., with ice to suck. As the incisions were bleeding freely no further treatment in this direction was adopted.

The condition slowly and steadily improved and in four days' time the patient was able to take semi-solid food and talk. The tongue was now well inside the mouth and half the original size. On the 27th both the tongue and throat were quite normal, and the patient was discharged.

Remarks.—From personal experience and from the literature at our disposal, this condition is evidently a rare one and worth reporting. The condition looked alarming on admission, and in view of the rapid increase in size the possibility of tracheotomy was considered. The free and early incisions no doubt saved the necessity for this serious operation.

Liver Abscess. Operation. Second Operation three and a half months later. Recovery.

A German, aged 43, was admitted on January 23rd, suffering from dysentery, fever and pain in right side. Stools contained blood and mucus, but no amœbæ. Temperature chart was of an irregular remittent type. Liver dulness was much increased downwards and a rub was heard all along right base. Under salines the dysentery ceased in three days, but as the hepatic symptoms continued, on January 29th the liver was explored and an abscess found. This was incised and a tube (silver) inserted. Though the cavity drained well the temperature still ran a remittent course, very suggestive of one or more other abscesses.

The patient being very weak no further exploration was attempted, and the temperature finally fell to normal three weeks after the operation and did not rise again. The abscess healed without trouble. His weight increased from 9 to 10·10½ st., and he was discharged on March 31st.

Readmitted April 9th for ten days suffering from alcoholism. The operation wound was quite firm and he had no liver symptoms.

Readmitted on April 28th suffering from alcoholism, fever and pain on right side. The liver dulness was increased downwards, with tenderness along the lower border of the ribs. The temperature ranged between 99° and 103°, and there was a rub at right base. On May 10th the liver was again aspirated over the site of the previous incision and pus was found. The abscess was a very small one and a tube was inserted. The temperature again kept up for five days, but then fell to normal, and the abscess rapidly healed, and the patient was discharged on June 5th.

He was again in hospital on June 9th suffering from his old complaint—alcoholism—and was discharged on the 17th, having, meanwhile, as he gravely informed us, signed the pledge.

Remarks.—This is somewhat an unusual case and shows how much some patients can stand. He was very ill on both occasions when operated on, and even in the alcoholic visits suffered badly. The case is interesting, inasmuch as the first abscess seemed to be due to the dysentery, which was non-malarial and non-amœbic. Though dysentery is common enough here, liver abscess is comparatively rare, more especially amongst Indians, who, however, suffer badly from dysentery.

Colonial Medical Reports.—No. 12.—Seychelles.

Medical Report on the Seychelles for the Year 1904.

By Dr. Robert Denman.

Chief Medical Officer.

Vital Statistics.—(1) The Registrar's return for the year 1904 gives a total population of 20,418, an increase of 446 over the preceding year.

(2) The birth-rate is stated as 34·92, is higher than for the last seven years, being 31·27.

(3) The death-rate shows a very satisfactory decrease, being only 16·12 per thousand. The average for the past seven years was 17·07.

(4) Infantile mortality has greatly diminished. The number of children who died before they reached the age of five years was only 95.

This compares very favourably with the returns for the five preceding years, which were as follows:—

1903	1902	1901	1900	1891
155	122	148	120	121

This may be accounted for by the large number of children who died in 1903, when most of the sickly ones succumbed either directly or indirectly to the epidemic of measles which attacked nearly all the little ones in the Colony.

(5) The deaths of five centenarians were recorded during the year, one person in South Mahé having reached the ripe age of 114 years.

(6) There were 49 still births and 20 twin births in the twelve months.

Meteorological Statistics.—The mean temperature, taken from observations made twice a day, is 77·66° Fahrenheit. This is the lowest temperature I have recorded as yet, and is 1·38° below the average for the years 1898 to 1903 inclusive, and considering the situation of these islands, only 4·35° south of the equator, it will probably never be beaten. A mean shade minimum of less than 70° was registered for eight out of the twelve months, the lowest being 68·2 in November, which again was one of the three coldest months of the year.

The total rainfall was 107·05 inches, and was well up to the average. More than half of the rain, however, fell in January and November, and these two months were responsible for 53·53 inches between them.

There was a marked scarcity of rain in the five months from March to July, during which period only 5·16 inches fell, and of this quantity 3·66 inches fell in four days in April. The result of this was a drought, which did incalculable damage to the plantations, for not only did vanilla vines and cocoanut trees die from want of rain at the sea level, but those plantations which might, from their higher situations on the mountain sides, have escaped with the help of the dews suffered severely from forest fires, which became very common and caused a great deal of destruction towards the end of the dry weather.

The south-east trade wind, or, as it is called here, the monsoon, broke in the middle of April and continued without interruption until the middle of November. It was stronger than usual, and probably helped to account for the low temperatures which prevailed during these months.

Diseases Prevalent during the Year.

There were no epidemics. On other diseases I have nothing special to report.

There was a certain amount of diarrhœa at the commencement of the rains and towards the end of the dry weather, but the year on the whole was a very healthy one.

(2) The causes of death as registered give no help towards determining the existence of any special disease at any given season. The declarations are most often made by ignorant people, and in most cases without any medical certificate.

(3) Cases of phthisis did better than usual this year owing to the dry weather. I must emphasise the remarks I made last year regarding this place as a health resort for consumptive persons; I do not think that it is possible to find a worse place than Mahé for these cases. In ordinary years the air is too moist, the food is too poor, and the accommodation too rough for them.

(4) On the other hand, cases of malarial fever do very well here. They may have one attack soon after landing; this they soon shake off, and do not get a relapse as long as they remain in the colony.

State of the Town of Victoria.

Scavengering has been more satisfactorily carried out this year. The contractor seems to have profited by the experience of the past few years, and now performs his duties with less inconvenience to the public. Even now the night soil service is far from perfect.

In ordinary years the supply is sufficient for the service of the town. A new "reservoir" has been built higher up on the Lablache River, and the supply to the north end of the town is somewhat improved. The year under consideration tested the capabilities of the supply very severely, and though there was great scarcity for some time towards the end of the very dry weather, the supply was never entirely arrested. The state of affairs was sufficiently grave to make the question of an increased and more reliable supply a very important one, and though the expenses connected with any new scheme may appear to be great, I am of opinion that the money so spent would be well spent, as the town will then be free from all fear of failure of water for drinking, and if the St. Louis river plan be adopted it will also be possible by the judicious arrangements of street hydrants to protect the town against a serious outbreak of fire. At present it may be said to be unprotected, as the two small hand

pumps on carts are quite insufficient to cope with even a small fire.

Reports of the Assistant Medical Officers of South Mahe and Praslin Districts.

These reports are forwarded herewith. They are interesting in that they contain the expressions of opinions formed by their writers after three years, experience in their respective districts. Both of these gentlemen agree with me in noticing the absence of any epidemic during the year, and they both remark upon the great improvement in the general health of their parts of the colony as compared with 1903.

I do not think that the death-rate of 14·08 per mille for Praslin, and 14·01 for South Mahé can be beaten by any other tropical colony.

The difference between the death rates for these two districts and that of the whole colony is partly accounted for by the fact that the Registrar bases his rate on the estimated population at the beginning of the year, whilst that of the outlying districts has been based upon that of the end of 1904, and partly by the fact that a good many of the incurable people from both districts come to town to die.

Vaccination.

Owing to the interruption of the mail service, vaccination had to be suspended for several months. It was resumed as soon as fresh lymph arrived, and the lymph, except that which had continued to be despatched monthly from London during the Marseilles strikes and which have been left lying at that port pending the resumption of the mail service and which was also worthless, was of good quality and gave very good results.

	Victoria Hospital.	Anse Royale.
Successful 1st time	234	126
,, 2nd ,,	48	19
,, 3rd ,,	16	—
Unsuccessful	18	1
	316	146

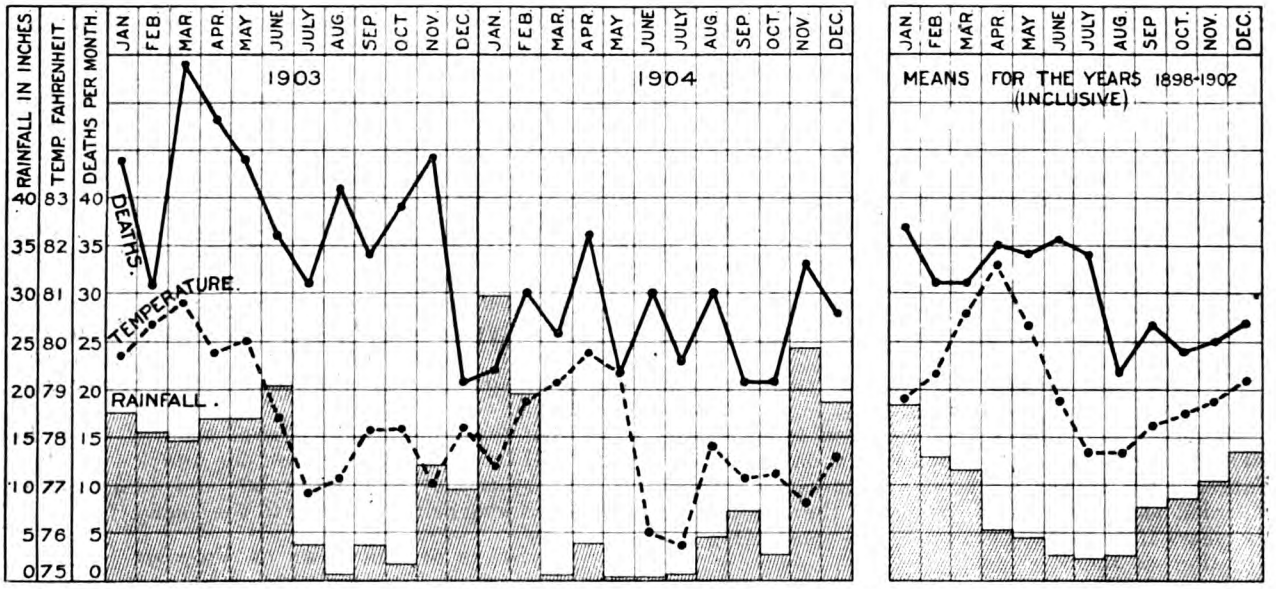
Quarantine Services.

The quarantine station at Long Island was used during the earlier part of the year. At my last inspection the disinfector worked satisfactorily and the houses and stores were in good condition, and the guardian deserves credit for the care he bestows upon the property committed to his charge.

Hospitals and Dispensaries.

No new dispensaries have been opened during the year. The increase in the number of patients requiring free treatment is due to the increased poverty amongst the lower classes, and not to any increase in the amount of sickness.

Two hundred and ninety patients were treated at the hospital during the year, viz., 241 males and 49 females.



Twenty deaths occurred, giving a death-rate of 6·8 per cent., an improvement upon last year.

The combination amongst the whole staff has been very good, the nursing sisters as usual doing excellent work, and earning the golden opinions of the medical officers and the heartfelt gratitude of the sufferers under their care.

Estimated Population on December 31st, 1903.

	Males	Females	Total
	10,267	9,705	19,972
Births during 1904	366	332	698
	10,633	10,037	20,670
Arrivals during 1904... ...	315	103	418
	10,948	10,140	21,088
Decrease by deaths during 1904	169	153	322
	10,779	9,987	20,766
Decrease by departures during 1904 ...	281	67	348
	10,498	9,920	20,418

ESTIMATED POPULATION—*continued.*

	Males	Females	Total
Brought forward ...	10,498	9,920	20,418
Estimated population December 31st, 1904 ...	10,267	9,705	19,972
Net increase during 1904 ...	231	215	446

Birth rate during 1904 ... ... 34·94 per mille.
Death ,, ,, ... 16·12 ,, ,,

AGES AT WHICH DEATH HAS OCCURRED.

Under 1 year		1 to 5 years		5 to 70 years		70 to 100 years		Over 100 years		Total	
M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
34	27	17	17	92	78	23	29	3	2	169	152
61		34		170		52		5		321	

Still births, 32 males and 17 females. Total 49.
There were 20 twin births during the year.

	Cases.	Deaths.
Accidents	57	1
General Diseases—		
Abdominal Tumour	3	—
Abscess	8	—
Alcoholism	1	—
Anæmia	6	1
Cellulitis	2	—
Chicken Pox	2	—
Cyst	1	—
Diabetes	1	—
Epulis	2	—
Gangrene	1	—
General Diseases—*continued*—		
Goître	1	—
Gonorrhœa	27	—
Hæmorrhoids	1	—
Hernia	3	—
Hip Disease	1	—
Hydrocele	3	—
Ichthyosis	2	—
Imbecile	1	—
Itch	13	—
Lumbago...	2	—
Lymphangitis	1	—
Malaria	1	—
Malingering	1	—
Old Age	10	5
Pharyngitis	1	—
Pyrexia	1	—
Rheumatism	13	—
Sloughing Scrotum	1	—
Syphilis	7	—
* Ulcers	10	—
Worms	7	—
Diseases of the—		
Nervous System...	10	4
Eye—Conjunctivitis	2	—
Heart	9	1
Respiratory Organs	24	2
Urinary Organs—Cystitis	3	—
Digestive System—		
Constipation	5	—
Diarrhœa	13	1
Dysentery	5	—
Dyspepsia	3	—
Hepatitis...	17	2
Intussusception	1	1
Liver Abscess	1	—
Generative Organs—		
Confinements	2	—
Ovarian Tumours	1	—
Paraphymosis	1	—
Salpyngitis	1	—
Uterine Tumour	1	1

Month	Barometer	Solar Max.	Min. on Grass	Shade Max.	Shade Min.	Range	Mean	Amount in Inches	Depth of Humidity	Direction of Wind	Average Force	Deaths per Month	Remarks
January	30·04	—	72·9	83·9	70·2	13·7	77·4	29·52	2·35	N.W.	4·7	22	—
February ..	30·04	—	72·8	85·2	71·0	14·2	78·76	14·48	5·23	N.W.	5·1	30	*
March	30 07	—	69·9	85·6	68·8	16·8	79·05	0·56	6·62	N.	3·3	26	—
April	30·05	161·5	73·0	87·2	72·3	14·9	79·79	3·97	6·50	N.W.* / S.E.†	3·4	36	—
May	30·06	156·6	70·8	85·8	69·6	16·2	79·42	0·19	8·30	S.E.	7·3	22	—
June	30·14	144	69·8	81·6	68·9	12·7	76·10	0·12	5·2	S.E.	12·2	30	—
July	30·09	147·2	71·9	81·3	69·6	11·7	75·77	0·32	5·6	S.E.	14·6	23	—
August	30·11	148	72·6	82·8	70·2	12·6	77·27	4·95	5·9	S.E.	13·4	30	—
September ..	30·13	154·4	70·3	84·7	69·4	14·3	77·04	7·15	4·1	S.E.	11·5	21	—
October	30·07	160·2	70·2	84·2	69·7	14·5	77·2	2·82	6·9	S.E.* / S.E. & calm †	8·6	21	—
November ..	30·09	158·2	68·9	84·3	68·2	16·1	76·65	24·03	4·1	Var. & calm	4·7	23	—
December ..	30·06	156·2	71·8	85·0	69·9	15·1	77·50	18·94	4·8	N.W.	5·9	28	—
								107·05				312	

* To 15th April.
To 11th November.

† After 15th April.
After 11th November.

RETURN OF OUT-PATIENTS TREATED AT THE DISPENSARIES.

Month	Victoria Hospital		Anse Royale		Anse Boileau		Praslin		Total
	M.	F.	M.	F.	M.	F.	M.	F.	M. & F.
January	25	119	18	15	15	4	17	12	225
February	45	185	22	9	5	7	24	12	309
March	39	202	29	11	8	2	28	14	333
April	39	129	24	13	5	6	15	14	245
May	26	172	31	7	—	4	12	13	265
June	42	144	25	12	—	3	13	12	251
July	56	163	18	7	2	3	18	14	281
August	32	126	23	5	2	7	16	20	231
September	52	148	22	7	3	6	22	14	274
October	55	173	22	5	8	6	17	16	302
November	29	145	27	6	3	4	33	19	266
December	50	181	29*	13	5	8	16	17	319

RESULT OF CASES TREATED AT THE VICTORIA HOSPITAL.

Sexes	Remaining in Hospital at the end of 1903	Admitted during 1904	Total treated	Cured	Relieved	Unrelieved	Died	Remaining at the end of 1904	Total
Males	10	231	241	178	30	11	16	6	241
Females	2	47	49	32	8	2	4	3	49
Total	12	278	290	210	38	13	20	9	290

MEDICAL REPORT ON SOUTH MAHE FOR THE YEAR 1904.

By Dr. J. T. BRADLEY, ASSISTANT MEDICAL OFFICER.

I have the honour to forward the third Annual Report on South Mahé, first and second divisions.

The year 1904 saw no serious outbreak of any disease like the epidemic of measles in 1903. Measles died out in this district on November 26th, 1903; after that date no further case of measles occurred in the district.

I intend in this report to draw attention to the great number of people who are affected with hernia. From a study of the cases that came under my notice I am of opinion that heredity plays an important *rôle* in this disease. Hernia in Seychelles follows certain lines, and the principal causes in the causation of hernia are as follows:—First, hereditary influence; if the parents have hernia, very often the children develop hernia within the first year of life, at times within a few days after birth. Further, I am of opinion that when hernia is on the male side it seems to be transmitted oftener than from the female side. Second influence is, no doubt, the tropical climate, as it produces a certain weakening of the abdominal tissues; this, combined with the continued climbing of the hilly and mountainous districts, can be looked on as the second important factor.

The other influences are the same as in Europe, viz., strain, unusual exertion, and in the case of women, constipation. Children with hernia are allowed to go about without any special precautions being taken by the parents; the ordinary congenital forms are in males inguinal, in females umbilical. As they grow to adult life these hernias get larger, and are the cause of much suffering and annoyance in after life. A lot of this could be avoided if the parents would only take simple precautions; in the case of an umbilical hernia, by a binder fitting the loins and a small piece of metal covering the hernial opening. In the case of inguinal hernias I always advise the patients to get a small truss at the Victoria Hospital, where they are sold at a reasonable price. Very often, in the case of children, if proper fitting trusses are worn the hernial opening closes up.

The year 1904 had in South Mahé a good many cases of dysentery. This may be due to the great dryness in the early part of the year, followed by the heavy rains at the close of the year.

Pneumonia is, in my opinion, always the most dangerous disease in the Seychelles; during the year 1904 the deaths were four, but the year was singularly free from the disease. I am of opinion that the bulk of deaths uncertified, where the cause is given as fever, are almost always due to pneumonia.

(To be continued in next Journal.)

Colonial Medical Reports.—No. 12.—SEYCHELLES
(continued).

I think there is an improvement in the health of children here. I continually impress on mothers the importance of breast feeding, and in the bulk of the families here no attempt is made now to give food beyond the breast for the first three months of infant life. As a result the infant mortality has dropped considerably. In 1902 the number of children that died under one year was sixteen, in 1903 the mortality was ten, and in 1904 the mortality was twelve. However, in 1904 in this mortality there were, of the twelve children that died, three children that survived birth only a couple of hours.

Vital Statistics.

Further on can be found the attached tables, showing a comparison of the births, deaths, and still-births of the years 1902, 1903 and 1904, also comparative tables of the ages at which death occurred during these years.

I would like to draw attention to the mortality tables, in order to see what is the dangerous periods to life in Seychelles.

For the first year after birth the dangerous period is very marked; roughly speaking, about one-fifth of the deaths occurred in the first year. If a child weathers the first year the zone of danger commences to diminish, but it is still a critical time. From five years to twenty years the danger commences to diminish, but it is a more dangerous period than from twenty to thirty, when the mortality is less. The most favourable period to life is thirty to forty, after forty the dangerous zone commences again. At sixty to seventy the chances are gone down very low; in fact, from fifty years upwards the danger to life is well marked. During the year 1904 there were two very ripe ages recorded, viz., one of 114 years, and one of 100 years.

It is a matter of congratulation the steady decrease in the mortality of children. In 1902 the number of deaths of children under five years was 28, in 1903 the mortality under five years was 21, a decrease of 7, while in 1904 the mortality under five years was 17, a decrease of 4 as compared to 1903, and compared with 1902 a decrease of 11.

Taking the births as 155 for the year 1904, the deaths as 63, the increase in population for the year 1904 is 92. This increase added to the increase in 1902 and 1903 makes a net increase of 293 for these three years.

1901.	Census taken in that year's population	4,203
1902.	Estimated population to December 31st	4,301
1903.	,, ,, ,,	4,404
1904.	,, ,, ,,	4,496

The number of deaths for the year in South Mahé was 63, a diminution of 3 as compared with the year 1903. I think this can be looked upon as the natural state of affairs. A good many deaths were due to old age, as 16 deaths occurred in people under 80 years of age, 3 deaths under 90 years, and 5 deaths over 90 years of age. Of these over 90 years one had reached 114 years, and the other 100 years.

Taking the estimated population as 4,496, this works out a death-rate of 14·01 per thousand, being a diminution of ·97 per thousand as compared with 1903.

The diseases that principally caused death during 1904 are as follows:—Senile decay, 16; dysentery, 5; pneumonia, 4; syphilis, 4; syphilis hereditary, 5; diseases due to endocarditis, 3.

During the year there were 11 still-births. A curious fact is that for the years 1902, 1903 and 1904, there were exactly the same number.

During the year there were 155 births, a diminution of 14 as compared with 1903. The average birth-rate per thousand for 1904 is 34·47, being a diminution of 3·90 per thousand as compared with the preceding year.

Dispensaries of Anse Royale and Anse Boileau.

The dispensary at Anse Royale was well attended during the year on Mondays, Wednesdays, and Fridays by the poor; during the year there were 400 consultations.

A dispensary is held at Anse Boileau every Thursday morning; the number of consultations for the year was 114.

Further on I have attached tables showing the diseases treated at the dispensary and the number of consultations under each disease.

Vaccination.

I have nothing but praise for the vaccine lymph supplied; it nearly always took first time except when it got over four weeks here, when the lymph seems to lose vitality. It produced large typical vesicles; one case is returned as unsuccessful, but I am of opinion this child is immune, as I vaccinated it with fresh lymph, then I tried it with lymph taken direct from the arm of a healthy child, result always the same.

Successful first time	126
,, second time	19
Unsuccessful	1
Total number of vaccinations	146

Surgeon's Work in Police Cases.

During the year there were twenty-nine police cases at Anse Royale of wounds and blows, and six at Anse Boileau. The bulk of the cases were trivial, slight blows and contusions; some of the wounds were of a more serious nature that could be called dangerous to life.

On July 8th the Sub-inspector of Anse Royale reported the death of a man at Anse Louis under suspicious circumstances. Accompanied by the Sub-inspector I examined the body. I found a few slight marks on the head of no importance. From an investigation made by the Sub-inspector it was proved that the man was drunk on the evening before; he must have fallen at the place where the body was found, thus accounting for the wounds on the head. From examination of the body no apparent cause of death could be found, so a certificate was given of cardiac failure, following alcoholic poisoning.

Table of Diseases causing Death in South Mahé, First and Second Divisions, during 1904.

Causes of Death	Under 1 Year	Under 5 Years	Under 20 Years	Under 30 Years	Under 40 Years	Under 50 Years	Under 60 Years	Under 80 Years	90 Years	Over 90 Years	Total	Remarks
	2	...	..	...	...	...	...	...	...	...	2	
Apoplexy	...	...	...	...	...	...	...	2	...	...	2	
Anæmia	...	...	1	...	...	...	...	...	...	...	1	
Ascites	...	...	...	1*f*	...	...	...	...	...	...	1	
Decay Senile	...	...	...	...	...	...	1*b*	7	3	5*a*	16	
Dysentery...	1	2	...	...	...	...	...	2	...	...	5	
Endocarditis	.	...	1	...	1*e*	...	1	...	...	...	3	
,, congenital ...	1	...	...	...	...	...	...	...	...	...	1	
Gangrene of foot... ...	...	..	..	...	...	...	1	...	...	..	1	
,, ,, lungs ...	...	...	...	...	...	2*c*	...	...	...	...	2	
Gastritis	1	...	...	...	...	...	...	...	...	...	1	
Hemiplegia	..	...	...	...	...	1	1	...	...	...	2	
Hernia	...	...	1	...	...	...	...	...	..	...	1	
Influenza	...	1	...	...	...	...	...	..	...	...	1	
Leprosy	...	...	...	...	...	...	...	2	...	...	2	
Pneumonia	...	...	...	...	...	1	2	1	...	...	4	
Peritonitis	...	...	...	1	...	...	...	...	...	...	1	
Syphilis	...	...	...	1	...	...	1	2	...	...	4	
,, hereditary ...	2	2	1	...	...	...	...	...	...	...	5	
Starvation	1*d*	...	...	...	...	...	...	...	...	...	1	
Tuberculosis	...	...	...	..	...	...	...	...	...	...	...	
Unclassified cause given by relatives :												
Fevers	1	..	...	...	...	...	2	...	...	...	3	
Infantile disease ...	3	...	...	...	...	...	...	...	...	...	3	
Worms	...	...	1	...	...	...	...	...	...	...	1	
	12	5	4	4	1	4	9	16	3	5	63	

a Senile decay: there were two people who died at the ripe age of 114 years and 100 years.
b This person was declared as 53 years of age at death. I am of opinion the age was nearer to 70.
c One of the cases of gangrene of the lungs could also be declared under tuberculosis.
d Child of a coolie immigrant at Pte. au Sel camp. The child lived 3 days. Mother refused to give it any nourishment, as it seemed to be the caste custom. Child, being a puny infant, gave up the contest, and died on the 3rd day.
e One of the cases of endocarditis was due to alcoholic excesses and exposure. I made a complete inquiry into the case.
f A *post mortem* was made in this case.

Comparative Tables of the Ages at which Death occurred during the years 1902, 1903 and 1904.

Years	1 year	Over 5	20	30	40	50	60	80	90	Over 90 years	Total and Remarks.
1902	16	12	1	9	5	7	4	2	3	—	59 deaths during 1902
1903	10	11	10	8	4	5	5	9	—	4	66 ,, ,, 1903
1904	12	5	4	4	1	4	9	16	3	5	63 ,, ,, 1904

Comparative Tables of Births, Deaths and Still Births during the years 1902, 1903 and 1904.

Year	Births	Deaths	Still Births	Remarks
1902	157	59	11	Births in 1903 exceeded that of 1902 by 12, while the births of 1904 show a diminution of 14 when compared with 1903.—Deaths in 1903 exceeded that of 1902 by 7, while 1904 shows a diminution of 3 when compared with 1903.—Still births for the years 1902-03-04 show no change.
1903	169	66	11	
1904	155	63	11	

The following were the complaints treated at Anse Royale and Anse Boileau Dispensaries :—

Disease.	Anse Royale. No. of Consultations.	Anse Boileau. No. of Consultations.
Anæmia	36	—
Asthmatic Bronchitis	1	—
Asthma	3	5
Amenorrhœa	3	2
Antrum, diseased	1	
Ascites	5	—
Bronchitis, acute	2	1
,, chronic	4	5
Bright's Disease	5	1
Constipation	5	1
Colitis	5	—
Colic	—	1
Climateric	10	—
Conjunctivitis	1	—
Diarrhœa	—	1
Dysentery	10	9
Dental abscess	3	—
Dysmenorrhœa	1	—
Debility	24	16
Doubtful	1	—
Endocarditis	3	—
Elephantiasis	—	4
Fibroid of uterus	20	—
Gastritis	4	—
Gonorrhœa	21	4
,, warts	1	—
,, bubo	4	—
,, rheumatism	2	—
Gangrene of lungs	2	—
Hernia	3	1
Hysteria	14	7
Hepatitis	8	—
Hemiplegia	—	4
Injury to eye	1	—
,, ,, foot	8	—
,, ,, finger	1	1
,, ,, left side	1	—
,, ,, shoulder	2	—

Disease.	Anse Royale. No. of Consultations.	Anse Boileau. No. of Consultations.
Indigestion	1	—
Influenza	2	—
Iritis	3	2
Leprosy	7	4
Laryngitis	3	—
Lumbago	2	—
Leucorrhœa	1	—
Marasmus	2	1
Malingering	3	1
Migraine	1	—
Malarial Fever *	9	—
Miscarriage	3	—
Neuralgia	1	—
Neurasthenia	2	4
Osteitis	43	—
Otorrhœa	3	—
Ovaritis	—	18
Prickly heat	2	—
Pneumonia	5	—
Phthisis	3	—
Rheumatism	14	8
,, muscular	1	—
Syphilis	37	2
Scabies	3	—
Sciatica	2	—
Syphilis, hereditary	1	6
Torticollis	4	1
Ulcers, tropical	6	—
,, syphilitic	2	—
,, varicose	2	1
,, cornea	8	—
Varicocoli	1	—
Wounds of arm	1	—
,, ,, leg	6	—
,, ,, head	1	—
,, ,, finger	1	—
Worms (*Ascaris lumbricoides*)	2	3

* Principally with coolies, Pt.-au-Sel Camp. Indian immigrants.

COMPARATIVE TABLES OF THE PRINCIPAL DISEASES CAUSING DEATH IN ST. MAHÉ DURING THE YEARS 1902, 1903 AND 1904.

Diseases	Year 1902											Total 1902	Year 1903											Total 1903	Year 1904											Total 1904
	Under 1 year	Under 5 years	Under 20 years	Under 30 years	Under 40 years	Under 50 years	Under 60 years	Under 80 years	Under 90 years	Over 90 years			Under 1 year	Under 5 years	Under 20 years	Under 30 years	Under 40 years	Under 50 years	Under 60 years	Under 80 years	Under 90 years	Over 90 years			Under 1 year	Under 5 years	Under 20 years	Under 30 years	Under 40 years	Under 50 years	Under 60 years	Under 80 years	Under 90 years	Over 90 years		
Apoplexy																																2				2
Asthma	1	3		1								4																								
Accidents, &c.					2							2																								
Aneurism							1					1																								
Cancer						1						1																								
Cardiac disease							1					1		2	1		1	1	1	2				8	1		1		1		1					4
Dysentery	1	2										3		3	2				1					6	1	2						2				5
Elephantiasis																			1	1				2												
Gastritis		2										2	6	1					1					8	1											1
Gangrene																	1			1				2					2							2
Hernia							1					1																1								1
Hemiplegia							1	1		2		4								2		1		3					1	1						2
Leprosy					1		1					2																				2				2
Peritonitis		2						1				2																1								1
Pleurisy					1							1																								
Pneumonia	1		1	1	1	1	2					7		2	3	3								8					1	2	4					1
Senile decay									1	1		2								3		3		6							1	7	3	5		16
Urethral disease						1						1																								
Syphilis					1							1		1			1	1						3	2	2	1	1			1	2				9

Medical Report on the Praslin District for the Year 1904.

By Dr. R. Laidlaw, Assistant Medical Officer.

During 1904 the health of the community has been exceedingly good, the birth-rate high, and the death-rate low.

The Leper Home and Pauper Camp have fed and ministered to the needs of their inmates as in past years; and, considering their depressing circumstances, there has been a fair amount of contentment.

Various efforts have been made to entice the inmates to engage in some form of light work, but without success. Basket-making, brush-making, and plain-stitching have been proposed to some of the more active, but only to be quickly abandoned. They seem quite unable to see that some light occupation would lessen the monotony of their life, and add to its pleasures. A little is done by one leper in the shape of a vegetable garden; and a few others engage occasionally in rock-fishing. One female pauper, said to be over a hundred years of age, finds her chief delight in ground weeding, and in cleaning in front of her little house. No other male or female pauper shows a like spirit.

In December, 1904, the inmates were the same in number as in January, 1904, viz., 9 lepers and 10 paupers.

At St. Anne and Grande Anse, Praslin, and at La Digue, the three dispensaries have given free medical help to all needy cases. The number treated during the year has been:—

243 new and 165 old cases,

as against 159 new and 143 old cases the year before.

In an appendix a table is given of the more frequent diseases treated. All grave cases requiring continual care have been sent as usual to the hospital in Mahé.

No epidemic disease appeared in the district during the year; and no case of measles (so prevalent the preceding year) has occurred. A few sporadic cases of chicken-pox appeared, but they caused no serious trouble, and its spread was limited to the household where the first case arose.

The dreaded disease of leprosy is apparently stationary. The fresh cases arising outside Round Island simply counterbalance the deaths. A family liability to the malady is usually traceable in every fresh case. Even if the last new remedy, "leprolin," fails to be a specific, the gradual extinction of the disease from general causes is very probable. Strict segregation of all existing cases would probably hasten this desirable result.

The round-worm is still a widespread plague. As many as 50 worms have been passed, in some cases, after one dose of antidote. In one case 98 worms were.

Besides wounds arising from assault, incised wounds from cutting instruments have been common. In three cases the fingers of children have required amputation, and also the finger of an adult. In this case the neglected wound had mortified.

The estimated total population of the district on January 1st, 1904, was 2,982, and during the year the deaths among them were 42 in number. During the preceding year the deaths numbered 65.

Seven of the deaths during last year were those of children under twelve months. Mistaken methods of feeding are often to blame.

One hundred and seven births occurred during the year, outnumbering the deaths by 65. The one regrettable feature is the large proportion of illegitimate births. One-third of the whole (32 out of 107) were born out of wedlock.

The vaccine imported from home has given fair results on the whole, except that received at the close of the deranged arrival of mails.

Its delay in transit then seems to have wholly destroyed its activity.

The vaccine used in December was successful in almost every case.

APPENDIX.

Nature of Cases occurring in Dispensary Practice.

Abscess.	Hordeolum.
Adenitis.	Hysteria.
Amenorrhœa.	Impetigo.
Anæmia.	Insomnia.
Amygdalitis.	Keratitis.
Anasarca.	Laryngitis.
Ascites.	Leprosy.
Asthma.	Locomotor Ataxia.
Blenorrhagia.	Marasmus.
Bright's Disease.	Metritis.
Bronchitis.	Menorrhagia.
Bruises.	Neuralgia.
Bubo.	Nephritis.
Cardiac Palpitation.	Ophthalmia.
Valvular Disease.	Oesophagitis.
Caries.	Orchitis.
Cataract.	Ovaritis.
Catarrh.	Paralysis.
Constipation.	Periostitis.
Conjunctivitis.	Pleurisy.
Cystitis.	Pruritus.
Dentition fever.	Retinitis.
Dog-bites.	Rheumatism.
Dysentery.	Senile debility.
Dysmenorrhœa.	Spinal paralysis.
Dyspepsia.	Stomatitis.
Eczema.	Syphilis.
Emonisis Menne. ?	Tic douloureux.
Epilepsy.	Tonsillitis.
Epididymitis.	Toothache.
Fever.	Tumour.
Fibroid tumour.	Ulcer.
Fractures.	Whitlow.
Gastritis.	Worms.
Goitre.	Wounds.
Gonorrhœa.	Varicella.
Hæmoptysis.	Vomiting.

Colonial Medical Reports.—No. 13.—SOMALILAND.

Medical Report of the Somaliland Protectorate for the Year 1904.

By A. J. M. POGETY, M.D.

Senior Medical Officer.

General Health of the Districts.

In two of the large districts, namely, those of Berbera and Bulhas, a severe epidemic of small-pox has occurred. This epidemic has now practically ceased.

Meteorology.

The conditions in those parts of the Protectorate which were free from the above epidemic of small-pox show a generally favourable meteorological condition, with a slight increase of rainfall. For the Province:—

In 1903 this was 1·47 inches; in 1904, 3·29 inches

Population.

The total population of the Protectorate is given at 300,000. I am of opinion that the population from which patients are drawn does not much exceed 20,000 in all, accounted for more by the native independence of character than actual distance from European-managed hospitals.

Major Operations.

Of the eighteen major operations performed at the different hospitals, I think it is particularly gratifying to note that only one death occurred. The local conditions are certainly not unfavourable, therefore, to operative procedure under ordinary aseptic precautions.

Tabulation of Diseases.

I have endeavoured to amplify this table where advisable in the paragraphs which follow it, as the classification is, of course, a wide one, and is not altogether free from cases of doubtfully correct diagnosis.

Dysentery.

Of the very large number of these cases recorded in the returns, I have been unable to meet with a single case of true dysentery during the eight months I have been in the country, and though it doubtless does occur, the cases so recorded by the hospital assistants seem to have never been more severe than a mucous colitis, and in one case was confused with hæmorrhoids.

Malarial Fever.

Intermittent fever seems alone to be of frequent occurrence. It is attended by unusually high temperatures, and shows itself to be most markedly wanting in true periodicity in character. I hope to report before long on the types of anopheles mosquitoes met with locally, certain varieties not being numerous enough to easily secure specimens, causing the delay.

It is especially worthy of note that no cases of hæmoglobinuric fever are recorded.

New Growths.

No cases of malignant new growths are recorded. The non-malignant growths were:—

(1) Papilloma of the face.
(2) Myceloma of the foot.
(3) Lipomatous tumours.

Tubercle.

Some at least of the recorded cases are open to very considerable doubt, as no microscopic examination was made. The number of cases recorded seems to be gradually increasing, however.

Digestive System.

Caries of teeth and constipation are responsible for the bulk of the digestive system diseases.

Diseases of the Skin.

The large number of ulcers shown may be taken collectively to be the usual foul spreading ulcers met with on the ankle of badly-nourished natives over most parts of Africa, and are occasioned by dirt and carelessness in attending to slight abrasions.

RETURN OF DISEASES AND DEATHS IN 1904-1905, AT THE

Barbera, Bulhar, and Zaila Hospitals and Dispensaries.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	—	—	—
Ánæmia	1	—	45
Anthrax	—	—	—
Beri-beri	—	—	—
Bharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	8	—	11
Cholera	—		—
Choleraic Diarrhœa	—	—	—
Congenital Malformation	—	—	—
Debility	12	1	70
Delirium Tremens	—	—	—
Dengue	—	—	—
Diabetes Mellitus	—	—	—
Diabetes Insipidus	—	—	—
Diphtheria	—	—	—
Dysentery	11	2	487
Enteric Fever	—	—	—
Erysipelas	—	—	—
Febricula	—	—	—
Filariasis	—	—	—
Gonorrhœa	9	—	190
Gout	—	—	—
Hydrophobia	—	—	—
Influenza	—	—	2
Kala-Azar	—	—	—
Leprosy	—	—	—
(*a*) Nodular	—	—	—
(*b*) Anæsthetic	—	—	—
(*c*) Mixed	—	—	—
Malarial Fever—	—	—	—
(*a*) Intermittent—	1	—	92
Quotidian	1	—	92
Tertian	44	—	962
Quartan	3	—	3
Irregular		—	—
Type undiagnosed	—	—	—
(*b*) Remittent	1	1	9
(*c*) Pernicious	—	—	—
(*d*) Malarial Cachexia	—	—	—
Malta Fever	—	—	—
Measles	—	—	—
Mumps	—	—	11
New Growths—			
Non-malignant	2	—	3
Malignant	—	—	—
Old Age	—	—	—
Other Diseases	—	—	—
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	—	—	—
Rachitis	—	—	—
Rheumatic Fever	—	—	—
Rheumatism	5	—	270
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	10	1	94
Septicæmia	—	—	—
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox	2115	892	2159
Syphilis—			
(*a*) Primary	—	—	4
(*b*) Secondary	7	—	37
(*c*) Tertiary	1	-	1
(*d*) Congenital	—	—	—
Tetanus	—	—	—
Trypanosoma Fever	—	—	—
Tubercle—	—	—	—
(*a*) Phthisis Pulmonalis	7	—	21
(*b*) Tuberculosis of Glands	1	—	4
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculous Disease of Bones	—	—	—
GENERAL DISEASES—*continued.*			
Other Tubercular Diseases	—	—	13
Varicella	—	—	—
Whooping Cough	—	—	2
Yaws	—	—	—
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	5	1	89
Circulatory System—	—	—	7
(*a*) Valvular Disease of Heart	—	—	—
(*b*) Other Diseases	—	—	—
Digestive System—	—	—	—
(*a*) Diarrhœa	10	—	76
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	—	—	2
Congestion of Liver	—	—	—
(*d*) Abscess of Liver	1	1	1
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	2	1	9
(*g*) Cirrhosis of Liver	—	—	—
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	2	—	747
Ear	—	—	122
Eye	4	—	310
Generative System—			
Male Organs	—	5	25
Female Organs	—		
Lymphatic System	6	—	31
Nervous System	6	1	110
Nose	—	—	—
Organs of Locomotion	17	1	22
Respiratory System	21	4	767
Skin—	—	—	—
(*a*) Scabies	1	—	74
(*b*) Ringworm	—	—	126
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	—	—	—
(*f*) Other Diseases	101	3	11679
Urinary System	1	—	5
Injuries, General, Local—			
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	28	—	508
Parasites—	—	—	—
Ascaris lumbricoides	—	—	11
Oxyuris vermicularis	—	—	3
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	—	—	—
Tape-worm	—	—	—
Poisons—			
Snake-bites	—	—	—
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	2
Other Poisons	—	—	—
Surgical Operations—			
Amputations, Major	18	1	18
,, Minor	—	—	313
Other Operations	—	—	—
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

Parasitic Diseases.

These diseases seem to be unusually rare on the coast, at least for a tropical region.

Boils.

During portions of the year boils are met with in more or less epidemic form, chiefly during the hot season, when much fine sand is carried in the air by the wind.

Diseases Affected by Occupation.

No special race or occupation disease is noted, except that of ringworm, which is frequent among the Soudanese pearl fishers and boatmen.

The following diseases, of special interest with regard to their distribution in tropical medicine, have not been met with :—

General Diseases.

Anthrax, hydrophobia, cholera, enteric fever, dengue, cerebro-spinal fever, rheumatic fever, beri-beri, lethargy, siriasis.

Diseases of the Blood.

Filariasis (F. nocturna or F. ozzar di).
Trypanosomiasis (Glossina papalis. G. morsitans).
Eosinophalia (of Flavia of ankylostomiasis).

Diseases of Urinary System.

Bilharzia. (In this I would beg to correct Mr. Sandwich, *Practitioner*, Oct, 1904.)

Diseases recognised by examination of fæces :—

Ankylostomiasis, Tricocephalus dispar, Anguillula intestinale, oxyurus, Vermicularis tænia, sprue.

Diseases of the Skin.

Leprosy, yaws, Dermatobia noxiatus. Congo floor maggot (or the fly Auchmeromyia luteola).

Local Affections.

Liver abscess, ainhum, goitre, guinea worm, chigger (jigger), ground itch.

No. 14.—WINDWARD ISLANDS, ST. VINCENT.

Medical Report on the Windward Islands, St. Vincent, for the Year 1904.

By C. W. BRANCH, M.D.,

Medical Officer, Kingstown District.

Colony Hospital.

(1) During the year there were 697 admissions, making, with those remaining from the previous year, 748 cases treated. This is far lower than the totals for the two previous years. It is not easy to explain this difference.

On the whole the population was healthier, no doubt, during 1904-5, but there were also admissions for uncinariasis. The labourers in the neighbourhood of the town have been, perhaps, to a great extent cleared of this parasite.

From the country only exaggerated cases reach hospital.

(2) The death-rate was high compared with that of the year before—52 deaths, or 6·95 per cent. of the total cases.

We have been unlucky in getting a large proportion of moribund cases; 17 died within three days of admission.

Table I.

Died on day of admission ...	... 3
,, ,, day after admission	... 4
,, 2 days after admission	... 6
,, 3 days after admission	... 4
	17

(3) The daily average of inmates for the year was 55, compared with 65 and 66 of former years.

(4) An abstract of admissions and results is shown in Table II.

An analysis of the diseases treated is presented in Table III.

(5) There were 229 operations scored, the nature and gravity of which appear in the classification appended (Table IV.).

The rule I have always followed in counting deaths after operation is to include every case that dies before leaving hospital, if he has been operated on, without reference to the time that has elapsed or the cause of death.

Changes of Staff.

(6) In April, 1904, I was absent at the Quarantine Conference in Barbados. Dr. C. N. Durrant acted for me.

On December 14th, 1904, I went on leave of absence for three months. Dr. C. N. Durrant acted in my stead until March 14th, 1905, when I resumed.

On July 27th, 1904, Miss Rachel Paterson, the special nurse, having completed the term of her engagement, returned to England. I can hardly overrate the value of her services to the hospital, and to the poor of the Colony. The improvements brought about by her suggestions, example and teaching, are a lasting memorial of her stay in St. Vincent. With her assistance, surgery of an ambitious character was feasible; but it is the best tribute to her teaching that aseptic abdominal surgery has been done since she left, with only the native nurses to carry out the details of preparation and nursing.

It seemed for some months after Miss Paterson left as if we should not be able to repair that loss until, through the generosity of the Colonial Nursing Association, we were fortunate enough to secure the services of Miss Beatrice Empson, who arrived in the Colony on March 28th, 1905.

(7) It is most desirable that the office of special nurse should be made permanent. West Indian hospitals can, with the help of such capable women as we have had, be raised to a high standard of efficiency. It is lamentable to think of how they must degenerate if such help cannot be maintained.

There is abundance of work, and I venture to say, work of an interesting and instructive character. The poor of the Colony experience and gratefully appreciate the way in which the ladies sent to us have done that work.

It is to be hoped that a way will be found to perpetuate the arrangement, that we may not suffer by having known better things.

Statement of Expenses. (Table V.)

(8) £1,305 were provided by the estimates for the year's service. Of this £260 16s. was saved. Paying patients and police contributed £36 11s. 10d. to revenue. The total saving on the estimates was, therefore, £297 7s. 10d.

Out-patient Department.

(9) This being the first complete year since the establishment of this part of the hospital work, a report can now be made. There had formerly been no out-patients of the hospital; the ordinary district cases of Kingstown and No. 1 District were seen by the medical officers at the hospital office.

As a slight effort to grapple with the tertiary syphilis of the island, I took on myself to treat all cases that came to my notice, and give free medicine from the hospital for as long as they could be induced to continue with the treatment.

It is not necessary for these chronic cases to be seen frequently by the doctor, and it was some tax on their time to wait often for hours their turn to come in.

In 1903, therefore, I issued cards which entitled the holders to free medicine and medical attendance at the hospital. After some months' trial the scheme seemed to be working well. It was then formally submitted to His Hon. the Administrator, and he had cards printed for me. The out-patient register was opened on July 1st, 1903.

When a patient has attended about twenty times he is given a new number and card. Up to March 31st, 1905, 629 cards were issued to persons from all parts of the island. The distribution of the patients is as follows:—

From Kingstown District	243
,, No. 1 District	169
,, No. 2 ,, ...	120
,, No. 3 ,, ...	64
,, No. 4 ,, ...	33
Total	629

(10) During 1904-5, 71 old patients attended 822 times, and 228 new patients were enrolled and attended 1,620 times. There have thus been 2,442 attendances for medicine by 299 patients—an average of 8·17 times each.

While many patients have been too careless or indolent to continue with their treatment, there have been, on the other hand, a large number who have consumed a considerable weight of potassium, iodide and mercury. These have received great benefit, which they gratefully acknowledge.

Though intended for the treatment of syphilis and parasyphilis, the system has been allowed to include other chronic diseases, such as cancer and consumption.

Pauper and Leper Asylums.

(11) The appended tables sufficiently exhibit the work performed at these institutions. (Tables VI., VII., VIII., and IX.)

A constant supply of potassium iodide at the Pauper Asylum ensures the circulation of patients; so that a number are returned to independent existence outside.

(12) During the year the recurring difficulty of keeping or of disposing of violent lunatics was to some extent met by the division of two wards. There are now two larger and two smaller rooms for females.

If the asylum at Grenada cannot accommodate the St. Vincent lunatics, some steps must soon be taken to provide a suitable place for the treatment of such cases.

Colonial Medical Reports.—No. 14.—Windward Islands, St. Vincent (*continued*).

TABLE II.

ABSTRACT OF ADMISSIONS AND DISCHARGES, 1904-5.

	Remaining from 1903-4	Admitted	Total Treated	Well	Relieved	Not Improved	Died	Carried forward to 1905-6
Males	29	375	405	256	73	10	34	32
Females	22	322	343	238	61	5	18	21
Total	51	697	748	494	134	15	52	53

TABLE V.

EXPENDITURE AND REVENUE, COLONIAL HOSPITAL, 1904-5.

Sub-head	Expenditure	Vote	Savings		
	£ s. d.	£	£ s. d.		£ s. d.
Salaries	429 9 0	444	14 11 0	Fees from Paying Patients ..	12 6 11
Dietary	390 9 11	500	109 10 1	,, ,, Police @ 6d. per day ..	24 4 11
Medicines and Disinfectants	83 1 11	150	66 18 1		
Clothing and Bedding	37 17 3	50	12 2 9		
Furniture and Implements	15 6 4	25	9 13 8		
Medical Comforts	12 14 6	40	27 5 6		
Fuel and Lights	25 2 2	35	9 17 10		
Uniforms	9 10 4	15	5 9 8		
Scavenging and Cleaning	14 9 6	15	0 10 6		
Telephone	6 0 0	6	0 0 0		
Contingencies	3 3 9	5	1 16 3		
Instruments	16 19 4	20	3 0 8		
	£1,044 4 0	1,305	260 16 0		£36 11 10

TABLE VI.

PAUPER ASYLUM.

	Remaining from 1903-4	Admitted	Total Cases	Discharged	Died	Remaining over
Males	66	32	98	15	22	61
Females	40	34	74	16	13	45
Total	106	66	172	31	35	106

TABLE VII.

LEPER ASYLUM.

	Remaining from 1903-4	Admitted	Total Cases	Discharged	Died	Remaining over
Males	3	3	6	1	—	5
Females..	6	1	7	2	1	4
Total	9	4	13	3	1	9

TABLE VIII.

LUNATIC ASYLUM.

	Remaining from 1903-4	Admitted	Total Cases	Discharged	Transferred to Grenada	Died	Remaining over
Males..	4	3		2	—	1	4
Females	7	8	15	5	4	—	6
Total	11	11	22	7	4	1	10

TABLE IX.

EXPENDITURE AND REVENUE, PAUPER AND LEPER ASYLUMS, 1904-5.

SAINT VINCENT.

Sub-head	Expenditure	Vote	Savings
	£ s. d.	£	£ s. d.
Salaries	195 18 0	196	0 2 0
Dietary	617 9 0	675	57 11 0
Clothing and Bedding	111 8 3	150	38 11 9
Fuel and Lights	10 16 6	15	4 3 6
Medicine and Disinfectants	35 12 5	50	14 7 7
Medical Comforts	15 0 10	20	4 19
Furniture and Implements	14 8 2	30	15 11 10
Upkeep of Donkey and Cart	6 19 5	9	2 0 7
Telephone	5 0 0	5	0 0 0
Scavenging and Cleaning	14 7 1	15	0 12 11
Contingencies	5 18 0	8	2 2 0
	£1,032 17 8	1,173	140 2 4

RETURN OF DISEASES AND DEATHS, 1904-1905, AT THE

Colony Hospital, Windward Islands, St. Vincent.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	2	—	3
Anæmia	—	—	—
Anthrax	2	—	2
Beri-beri	—	—	—
Bharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	—	—	—
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Congenital Malformation	—	—	—
Debility	—	—	—
Delirium Tremens	—	—	—
Dengue	—	—	—
Diabetes Mellitus	—	—	—
Diabetes Insipidus	—	—	—
Diphtheria	—	—	—
Dysentery	1	—	1
Enteric Fever	3	1	4
Erysipelas	—	—	—
Febricula	—	—	—
Filariasis	—	—	—
Gonorrhœa	11	—	11
Gout	—	—	—
Hydrophobia	—	—	—
Influenza	—	—	—
Kala-Azar	—	—	—
Leprosy	—	—	—
(*a*) Nodular	1	—	1
(*b*) Anæsthetic	—	—	—
(*c*) Mixed	—	—	—
Malarial Fever—	31	2	31
(*a*) Intermittent—	—	—	—
Quotidian	—	—	—
Tertian	—	—	—
Quartan	—	—	—
Irregular	—	—	—
Type undiagnosed	—	—	—
(*b*) Remittent	—	—	—
(*c*) Pernicious	—	—	—
(*d*) Malarial Cachexia	—	—	—
Malta Fever	—	—	—
Measles	—	—	—
Mumps	—	—	—
New Growths—			
Non-malignant	13	—	14
Malignant	10	1	11
Old Age	—	—	—
Other Diseases	—	—	—
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	—	—	—
Rachitis	—	—	—
Rheumatic Fever	—	—	—
Rheumatism	4	—	4
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	—	—	—
Septicæmia	—	—	—
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox	—	—	—
Syphilis—			
(*a*) Primary	11	—	12
(*b*) Secondary	134	5	153
(*c*) Tertiary	—	—	—
(*d*) Congenital	—	—	—
Tetanus	3	2	3
Trypanosoma Fever	—	—	—
Tubercle—	14	4	18
(*a*) Phthisis Pulmonalis	—	—	—
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculous Disease of Bones	—	—	—
GENERAL DISEASES—*continued.*			
Other Tubercular Diseases	—	—	—
Varicella	—	—	—
Whooping Cough	—	—	—
Yaws	—	—	—
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	25	2	26
Circulatory System—	—	—	—
(*a*) Valvular Disease of Heart	10	4	10
(*b*) Other Diseases	4	2	4
Digestive System—	—	—	—
(*a*) Diarrhœa	8	1	9
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	—	—	—
Congestion of Liver	—	—	—
(*d*) Abscess of Liver	—	—	—
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	—	—	—
(*g*) Cirrhosis of Liver	—	—	—
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	33	5	36
Ear	—	—	—
Eye	9	—	10
Generative System—			
Male Organs	9	—	9
Female Organs	69	4	71
Lymphatic System	—	—	—
Nervous System	21	4	22
Nose	—	—	—
Organs of Locomotion	7	—	8
Respiratory System	15	3	15
Skin—	23	1	29
(*a*) Scabies	—	—	—
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	—	—	—
(*f*) Other Diseases	—	—	—
Urinary System	25	2	26
Injuries, General, Local—			
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	42	—	43
Parasites—	135	6	139
Ascaris lumbricoides	—	—	—
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	—	—	—
Tape-worm	—	—	—
Poisons—			
Snake-bites	—	—	—
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	3	—	3
Surgical Operations—	—	12	229
Amputations, Major	—	—	—
,, Minor	—	—	—
Other Operations	—	—	—
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

No. 15.—The Straits Settlements.

Medical Report on the Straits Settlements for the Year 1903.

By Dr. D. K. McDowell.

Principal Civil Medical Officer, Straits Settlements.

Population and Health.

(1) The following table shows the estimated population and the birth and death-rates for the years 1902 and 1903 in the several Settlements.

	Estimated Mean Population		Births		Deaths		Birth Ratio per mille		Death Ratio per mille	
	1902	1903	1902	1903	1902	1903	1902	1903	1902	1903
Singapore	235,301	240,833	4,852	5,089	12,485	11,505	20·62	21·13	53·06	47·77
Penang	129,546	130,121	2,379	2,495	5,787	4,988	18·37	19·17	44·67	38·33
Dindings	4,181	4,236	135	136	185	137	32·29	32·10	44·25	32·34
Province Wellesley	110,267	117,078	3,698	3,813	3,476	3,279	31·82	32·57	29·90	28·01
Malacca	95,924	96,276	3,457	3,976	3,037	3,332	35·50	41·30	31·66	34·61
Total	581,219	588,544	14,521	15,509	24,970	23,241	24·98	26·35	42·96	39·49

(2) A notable and satisfactory feature in the above table is that in all the Settlements excepting Malacca the birth-rate in 1903 has gone up and the death-rate has fallen. The high death-rate in Malacca the Colonial Surgeon attributes, among other causes, to the heavy infantile mortality.

(3) The death-rate for the whole Colony was 39·49 in 1903, as against 42·96 in 1902, and 39·85 in 1901, and taking this as our guide, the public health of the Colony was better than in the previous two years, but it could not be considered as good. The improvement of the rate in 1903 over that of 1902 is, however, more apparent than real, for eliminating the deaths which took place on the quarantine stations, the rates would stand at 40·21 in 1902 and 39·01 in 1903, a slight improvement only.

(4) Out of the total number of deaths registered in 1903, 3,865 were amongst infants of under one year old, against 3,631 in 1902. This high infantile mortality, which was greatest among the natives, was no doubt due to want of care and over-feeding. Another factor contributing to the high death-rate in this Colony is the large number of paupers and decrepit people who find there way here from the neighbouring countries. The Colonial Surgeon, Penang, reports that strict measures are being carried out there against the landing of such undesirable people.

(5) The subjoined table gives the number of zymotic diseases in the several Settlements in the years 1902 and 1903, and deaths therefrom, not, of course, including cases imported to the Colony.

Plague.

The three cases of plague in 1903, all of which proved fatal, took place in different parts of the town among persons who had been resident here for not less than one year. One was an Indian and two were Chinese. All three cases were verified by bacteriological examinations and in no one could the source of infection be traced.

	Plague				Cholera				Small-pox			
	1902		1903		1902		1903		1902		1903	
Singapore	4	4	3	3	842	759	226	190	159	67	109	29
Penang	..	..	..	..	9	7	..	..	304	91	227	57
Province Wellesley	..	..	..	..	41	33	..	..	85	19	258	49
Malacca	..	..	..	..	1	1	..	..	57	22	266	40

Colonial Medical Reports.—No. 15.—The Straits Settlements (*continued*).

CHOLERA.

There were 226 cases in Singapore with 190 deaths, but none in the Settlements. The outbreak was not so severe as that of the previous year. Five cases occurred in the Lunatic Asylum, three proving fatal.

SMALL-POX.

The cases in all the Settlements were a continuation of the previous year's outbreaks, and in Province Wellesley and Malacca far exceeded those of 1902.

Several cases where the persons responsible had failed to report occurrences of small-pox were prosecuted by the Municipality in Singapore and heavy fines imposed. In Penang the Colonial Surgeon reports that no less than twenty cases were discovered after death.

ENTERIC FEVER.

One hundred and forty-eight cases, with 47 deaths, were reported in Singapore, of which 103 were treated in hospital, with 46 deaths. One hundred and forty deaths are reported from Penang, and only three cases appear to have been admitted in the Malacca hospital—two of these died. Reliable statistics from enteric fever cannot be obtained unless the cases are admitted into hospital or attended to by qualified medical practitioners. Although all dead bodies within municipal limits are inspected after death, to diagnose a case of enteric properly after death, except by *post mortem*, is difficult.

MEASLES, &c.

A few cases of measles, dengue and chicken-pox were reported in each of the Settlements. Three cases of diphtheria were treated in hospital in Singapore.

BERI-BERI.

(6) There were 1,919 admissions into hospital with 647 deaths, against 1,901 admissions and 575 deaths in 1902. The total number of deaths from this cause registered in 1903 was 1,729, and in 1902 it was 1,607. Although these figures are not so high as that of 1901, when the number registered was over 2,000, yet they show that beri-beri still contributes a high percentage in the mortality rates.

An interesting report by Dr. Leask on the existence of beri-beri in the prison at Singapore accompanies his report on the prison sanitation.

VENEREAL DISEASES.

(7) The admissions to all the hospitals from venereal diseases for 1903 numbered 1,818, with 96 deaths. It is satisfactory to notice the appreciable decrease in these figures as compared with those of the previous two years, which were 2,341 admissions with 90 deaths, in 1901, and 3,149 admissions with 171 deaths in 1902.

Of the admissions in 1903, 1,632 were males and 186 females, of whom 152 were prostitutes.

SANITATION.

(8) The general condition of the Colony, so far as the Municipalities of Singapore, Penang, and Malacca are concerned, may be considered satisfactory. The special feature in Malacca is that no outbreak of cholera has taken place there since the Municipal water supply was established.

At Butterworth sanitation has been much improved during the year; great activity is being shown in the substitution of brick buildings for atap houses. Improvement is also reported in the other districts.

(9) All the reports from the hospitals in the Colony, excepting Butterworth, state that the quantity of water supplied was unlimited and the quality was good.

HOSPITALS AND WORK DONE.

(10) The total number of admissions into the hospitals during 1903, excluding the Lunatic Asylum, was 23,150, against 25,624 in 1902. Excepting in the Tan Tock Seng Hospital and Quarantine Station in Singapore, the Leper Asylum at Pulau Jerejak, the District Hospitals at Butterworth and Bukit Mertajam in Province Wellesley and Jasin in Malacca, the admissions into the other hospitals have decreased.

(11) The subjoined table shows the work done for the last three years.

(12) The diseases responsible for the greatest number of admissions and deaths are shown in the subjoined Tables, compared with the corresponding diseases and deaths during 1902.

POISONS.

(13) There were 126 admissions, with six deaths, as follows:—

	Admissions.	Deaths.	
Opium	14	5	
Mercury	11	—	
Carbolic acid	1	—	
Alcohol	66	—	
Ammonia	1	—	
Stramonium	11	—	
Dog-bite	14	—	(Penang)
Opium habit	14	—	
Morphia habit ...	4	—	
Ptomaine	1	1	(Malacca)
Hydrargyri perchloride	2	—	

	Number of Patients Treated			Number of Deaths			Percentage of Deaths to Total Treated		
	Europeans	Asiatics	Total	Europeans	Asiatics	Total	Europeans	Asiatics	Total
(*a*) 1901	1,094	26,401	27,495	73	3,943	4,016	6·67	14·93	14·60
(*b*) 1902	1,159	26 515	27,674	68	4,406	4,474	5·86	16·61	16·16
(*c*) 1903	1,043	24,324	25,367	45	3,911	3,956	4·31	16·07	15·6

OPERATIONS.

(14) Eighty-nine operations were performed. There were nine deaths. This does not, however, give an idea of the amount of surgery that is done, especially at the General Hospital, Singapore, in connection with the treatment of cases classified under other headings. At the General Hospital, Singapore, alone, 200 such operations were performed.

(15) As requested by the Committee of the Cancer Research Fund, two sealed bottles were sent to the Superintendent, Victoria Embankment, London. One contained three small portions of a malignant growth removed from a patient at the General Hospital, Singapore, and the other cystic kidneys removed from a patient at the Tan Tock Seng Hospital. Notes of the cases were sent together with the respective bottles. Copies of the notes were also sent to the Colonial Office.

(16) The report on the Lunatic Asylum by Dr. Ellis shows that the recovery rate for 1903 was not so good as in the two previous years. Five cases of cholera took place among the female lunatics, three of which proved fatal. Prompt action in removing them to the Pasir Panjang ward at once stopped the epidemic. It is satisfactory to learn that beri-beri is showing signs of dying out.

With the increase in the number of patients in the asylum the industry in manufacturing cloth has also enlarged. It is a pity that there is no land available for cultivation.

(17) The health of the prisoners and police force shows an improvement in 1903 over that of 1902.

(18) There was an increase of work in the Maternity Hospital, Singapore. Nearly 50 per cent. of the inmates were natives of India. No Malay women appear to go to this hospital, but the Chinese are beginning to come to it.

No probationer passed out from this hospital in 1903.

(19) The Colonial Surgeons, Province Wellesley, both report a decrease in the number of coolies engaged in the different estates, and as a natural consequence the number of coolies treated in hospital has decreased. The general health has improved.

(20) After a great deal of correspondence for some years the Government has decided to remove the Tan Tock Seng Hospital to a more healthy site.

I.—GENERAL DISEASES.

Diseases	1902		1903	
	Admissions	Deaths	Admissions	Deaths
Dysentery	866	262	707	267
Malarial fever and cachexia	2,938	277	1,647	139
Beri-beri	1,901	575	1,919	647
Phagadæna	200	45	234	60
Tubercle of lungs	699	355	730	408
Venereal diseases	3,149	171	1,818	96
Rheumatism (acute and chronic)	436	..	1,075	..
Anæmia	761	197	964	262
Debility	926	272	907	339

II.—LOCAL DISEASES.

Diseases	1902		1903	
	Admissions	Deaths	Admissions	Deaths
Diseases of the nervous system (including admissions to the Lunatic Asylum, less cases transferred there from other hospitals)	675	113	736	112
Diseases of the respiratory system (not including phthisis)	915	271	574	108
Disease of the digestive system (including diarrhœa)	2,367	682	2,028	678
Disease of the skin	2,155	5	2,626	4

III.—INJURIES.

	1902		1903	
	Admissions	Deaths	Admissions	Deaths
General and local	1,521	54	1,557	56

Quarantine.

(21) The work in this department, both in Singapore and Penang, still continues to be heavy. No less than 424,940 passengers were examined on arrival, and 12,991 pilgrims on departure.

One hundred and thirty-six cases of plague were landed on the Quarantine Station at Singapore, and considering the close proximity of the town to this place and that not one case has taken place in the town from amongst the passengers landed, great credit is due to those in charge of this branch of the department for their vigilance and care in carrying on their arduous and responsible work.

Much needed improvements were carried out on St. John's Island, and the staff has been increased to cope with increased work, and so ensure greater efficiency.

Out-door Dispensaries.

(22) All the returns from the three principal dispensaries and those attached to the District Hospitals, except Butterworth, show increased work.

Eighteen thousand and twenty-nine persons were treated during the year, with an average daily visit of 150. I think that in Singapore there is room for another out-door dispensary in the Chinese part of the town; in any case, should the Government at any time take up the question of restricting unqualified private practice, the preliminary steps would be the starting of more out-door dispensaries.

Vaccination.

(23) The total number of vaccinations performed throughout the Colony during 1903 was 15,496, against 14,747 in 1902. The number of births registered in 1903 was 15,509, which shows that very few children (if any) remained unvaccinated. Of course, the number vaccinated includes adults, but these are comparatively few, and there are many children who die before being vaccinated.

The subjoined table shows the number vaccinated, with the results in the several Settlements.

These numbers do not include the vaccinatione performed at the prison or quarantine station. The number in Singapore includes 1,547 cases performed by licensed vaccinators. Although Saigon lymph was used in all the Settlements, the return shows that the best results were obtained in Singapore. This points to the conclusion that the cause of failures cannot be attributed solely to the bad quality of the lymph received sometimes. The percentage of failures was highest in Malacca, namely, 20·53. The Colonial Surgeon, Province Wellesley, attributes the failures there to carelessness of the vaccinators.

Settlement	No. of Vaccinations Performed	Result				
		Perfect	Modified	Failed	Unknown	
Singapore	2,738	2,733	..	5	..	(a)
	1,337	1,258	2	36	41	(b)
	210	195	..	14	1	(b)
Total	4,285	4,186	2	55	42	
Penang	3,419	2,068	541	562	248	
Dindings	145	129	5	7	4	
Province Wellesley	3,688	2,933	277	467	11	
Malacca	3,959	2,740	199	813	207	
Total	15,496	12,056	1,024	1,904	512	

(a) By Government Vaccinator. (b) By Licensed Vaccinators.

Report on Principal Diseases in Singapore Prison.

By Dr. J. Leask.

Colonial Surgeon in Charge.

(1) The diseases accountable for the greatest number of admissions to hospital were:—

Beri-beri, with 169 cases, as against 415 in 1902; fevers, with 168 cases, as against 188 in 1902; diarrhœa, with 112 cases, as against 186 in 1902; dysentery, with 104 cases, as against 156 in 1902; minor injuries, with 69 cases, as against 87 in 1902; eye diseases, with 57 cases, as against 31 in 1902; dyspepsia, with 43 cases, as against 66 in 1902.

Beri-beri.

(2) One hundred and twenty-five of the total of 169 cases of beri-beri were admitted during the last quarter of the year. During the first nine months of the year there had only been 44 admissions.

(3) The number of deaths during the last quarter was 14, out of a total of 16 for the whole year.

It has been noticed in previous years that the greatest number of admissions occur in the hot months

of May, June and July, and in the last quarter of the year. (See Table A.)

(4) Heat and moisture are favourable for the proliferation of micro-organisms, and this may account for exacerbations of beri-beri at these times, the proper degree of temperature on moisture being attained then.

(5) This will not always account for those sudden changes of activity which take place at times. The disease may slowly or suddenly disappear and re-appear at varying periods in the same way, and I think a possible explanation of these changes may lie in the supply, outside the human body, of pabulum to the micro-organisms, or there may be an accumulation of excretory products of the organisms themselves. The organisms may proliferate so rapidly that they exhaust the available supply of pabulum, and become quiescent until a further supply of pabulum is again available, or a favourable environment is attained.

(6) The passage of thus weakened micro-organisms through the human intestinal tract would intensify them, therefore too much importance cannot be attached to the proper disinfection of motions.

(7) At other times it would appear that the disease had been got thoroughly under. As mentioned in my report of 1898, there was no beri-beri in the prison for twelve years from 1885 to 1897, except two outside cases.

(8) The present outbreak began in 1897, the first case being in a prisoner eighteen days after admission to prison, the second thirteen weeks, and the third six days after admission.

(9) The incubation period of beri-beri is not known, Pekelharing makes it as long as five weeks, but it would be reasonable to allow that Nos. 1 and 3 were already in the incubatory stage of the disease, and possibly No. 2 also, and it may well be granted that the disease was introduced into the prison by these men, and has now become endemic, and has been from the beginning, the cause of 1,319 admissions and 67 deaths (5·07 per cent. of deaths).

(10) Many writers have advanced the theory that beri-beri is caused by diseased rice. The experiments made by Dr. Hamilton Wright in feeding prisoners on sterilised rice has exploded this; and that the diets of the prisoners could have nothing to do with the production of beri-beri was clearly shown in 1898, when a number of prisoners suffering from beri-beri were sent over to St. John's Island from this prison.

TABLE A.

TABLE SHOWING THE INCIDENCE OF BERI-BERI IN THE DIFFERENT GRADES.

Grade	1897	1898	1899	1900	1901	1902	1903
Upper		7	6	9	13	19	9
Middle		94	123	105	55	129	37
Lower		8	6	40	40	102	27
Short-sentence	3	12	23	52	102	136	88
Revenue		3	6	8	7	19	5
Civil prisoners		..	1	2	2	10	3
His Majesty's pleasure		..	..	1	..	..	..
Females		..	..	7	..	..	..
Total	3	124	165	224	219	415	169

TABLE A.—*(continued).*

TABLE SHOWING THE ADMISSIONS AND DEATHS FROM BERI-BERI IN EACH MONTH DURING THE LAST FOUR YEARS.

	1900		1901		1902		1903	
	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths
January	5	..	15	1	22	1	22	2
February	3	..	10	..	8	1	6	..
March	1	..	4	..	2	..	6	..
April	8	..	17	..	8	..	3	..
May	14	2	25	1	18	..	1	..
June	32	2	17	3	79	3	3	..
July	36	2	23	2	86	..	1	..
August	8	1	12	..	27	..	..	..
September	32	1	10	..	26	3	2	..
October	24	2	19	1	62	1	7	..
November	44	7	41	1	35	1	53	6
December	17	11	26	..	32	1	65	8
Total	224	28	219	9	415	11	169	13

(11) These prisoners were fed on exactly the same food as the prisoners in the gaol. All the rations were first brought to the goal, divided there, one portion going to St. John's, the other portion being used in the gaol.

(12) The prisoners on St. John's Island made remarkably rapid recoveries, while the beri-beri cases kept on occurring at the gaol just as before.

Grades.

(13) In the upper grade 9 cases occurred, in the middle grade 37 cases, lower grade 27 cases, revenue grade 5 cases, short-sentence 88 cases, and civil prisoners 3 cases.

(14) The lower grade prisoners, whatever their labour, are always in the yards, and the middle grade prisoners in their work-sheds.

(15) With the exception of a few men, who are employed as cleaners, assistant cooks, toties, grass-cutters, the short-sentence prisoners are employed at stonebreaking and wheel, the same labour as the lower grade.

(16) It is in the men working in the stonebreaking cells and work-yards that most of the cases of beri-beri occur.

(17) Very few cases occur in prisoners employed in open-air work about the kitchens, halls, or grass-cutting.

(18) From this I would infer that the ventilation in the yards is not yet what it should be, and that more exposure to sunlight should be allowed, and I would recommend that work outside the prison should be given to those men as was done before beri-beri broke out.

Nationalities.

(19) The nationalities of those attacked were: Chinese, 155, with 13 deaths; Malays, 11, with 3 deaths; Indians, 3, no deaths.

Deaths from Beri-beri.

(20) There were 16, of whom 2 were middle grade prisoners, 6 lower grade, 7 short-sentence, and 1 civil prisoner.

(21) Owing to the decrease in the number of beri-beri cases in the first quarter, the temporary work-shed outside D Block, which had been in constant use for five years, was no longer required, and sleeping in the old civil prison was discontinued.

(22) During the last quarter, owing to the increase of cases it was found necessary to use the temporary shed again. The hospital was overcrowded, and as the sleeping accommodation at the old civil prison was no longer available, 37 cases of beri-beri were sent to Malacca.

(23) At the end of the year there were 48 cases of beri-beri remaining in hospital.

Dysentery.

(24) A very severe and intractable type prevailed. One hundred and four cases were admitted, with 13 deaths, as against 150 cases and 15 deaths in 1902. During the last quarter there were 50 admissions and 8 deaths. The *post-mortem* examinations showed the whole of the large intestine ulcerated, undermined, and in some cases gangrenous.

(25) The number of cases in the different grades were: Upper grade, 8; middle grade, 17; lower grade, 18; short-sentence grade, 53; revenue grade, 6, and civil prisoners, 2.

(36) The deaths in the different grades were: Middle grade, 5; lower grade, 1; short-sentence grade, 6, and revenue grade, 1.

(27) The nationalities of those attacked were: Europeans, 2; Indians, 6; Malays, 14; and Chinese, 82.

(28) Diarrhœa and dyspepsia have caused considerably fewer admissions than last year.

(29) Fevers have been mostly of the febricula type. No Anopheles have ever been found in the prison.

Zymotic Diseases.

(30) Enteric fever: Four cases of this disease occurred, all in Chinese; three cases in January within a few days of each other, and the last case in December. All the cases recovered.

(31) The first was revenue grade No. 23, admitted to prison on October 30th, 1902, on a three months' sentence. He was admitted to hospital on January 7th, having had fever for three days. He worked as a cleaner, and his cell was in D hall.

(32) The second case was short-sentence No. 306, admitted to prison on December 1st, 1902, on a six months' sentence. He was admitted to hospital on January 9th, having had fever for two days; his work had been stonebreaking and treadmill, and his cell was in B hall.

(33) The third case, short sentence, No. 14, was admitted to prison on November 7th, 1902, on a three months' sentence, and to hospital on January 10th, 1903, having had fever for three days; his work had been stonebreaking and treadmill, and his cell was in B hall.

(34) The fourth case was a remand prisoner who was admitted to the Civil Prison on November 23rd, 1903, and was brought to hospital on December 4th, having been ill for about a week. In this case the clinical diagnosis was confirmed by a bacteriological one.

(35) The source of infection in the first three cases was probably within, and of the fourth without the prison.

Mumps.

(36) Fifteen cases of mumps were admitted, occurring in lower grade prisoners, 13; middle grade, 1; and short-sentence grade, 1.

Dengue.

(37) Six cases were admitted.

Deaths.

(38) There were 45 deaths this year in hospital. The causes of death were: Beri-beri, 16; dysentery, 13; tuberculosis, 6; cerebral apoplexy, 3; valvular disease of the heart, 2; and general debility, cirrhosis of liver, abscess of liver, peritonitis and glaucoma, with embolism of cerebral artery, each 1.

RETURN OF DISEASES AND DEATHS, 1902-1903, AT THE

Singapore Prison.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	22	—	23
Anæmia	597	175	632
Anthrax	—	—	
Beri-beri	1,293	457	1,465
Bharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	4	—	4
Cholera	344	232	344
Choleraic Diarrhœa	2	1	2
Congenital Malformation	—	—	—
Debility	518	198	551
Delirium Tremens	—	—	—
Dengue	51	—	52
Diabetes Mellitus	—	—	1
Diabetes Insipidus	—	—	—
Diphtheria	3	—	3
Dysentery	482	175	504
Enteric Fever	103	46	112
Erysipelas	1	—	1
Febricula	258	—	265
Filariasis	—	—	—
Gonorrhœa	147	—	162
Gout	6	—	6
Hydrophobia	—	—	—
Influenza	2	—	2
Kala-Azar	—	—	—
Leprosy	86	22	120
(*a*) Nodular		—	
(*b*) Anæsthetic	—	—	—
(*c*) Mixed	—	—	—
Malarial Fever—	868	78	933
(*a*) Intermittent—	—	—	—
Quotidian	—	—	—
Tertian	—	—	—
Quartan	—	—	—
Irregular	—	—	—
Type undiagnosed	166	28	166
(*b*) Remittent	—	—	—
(*c*) Pernicious	—	—	—
(*d*) Malarial Cachexia	35	0	35
Malta Fever	—	—	—
Measles	12	—	12
Mumps	21	—	21
New Growths—			
Non-malignant	11	—	12
Malignant	17	9	17
Old Age	—	—	—
Other Diseases	—	—	—
Pellagra	—	—	—
Plague	144	26	144
Pyæmia	4	4	4
Rachitis	—	—	—
Rheumatic Fever	—	—	—
Rheumatism	722	—	754
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	2	—	2
Septicæmia	4	3	4
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox	112	23	145
Syphilis—			
(*a*) Primary	212	—	238
(*b*) Secondary	476	60	511
(*c*) Tertiary	—	—	—
(*d*) Congenital	—	—	—
Tetanus	12	6	12
Trypanosoma Fever	—	—	—
Tubercle—	397	227	413
(*a*) Phthisis Pulmonalis		—	—
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculous Diseases of Bone	—	—	—
GENERAL DISEASES—*continued.*			
Other Tubercular Diseases	—	—	—
Varicella	—	—	—
Whooping Cough	—	—	—
Yaws	—	—	—
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	226	12	243
Circulatory System—	—	—	—
(*a*) Valvular Disease of Heart	32	20	38
(*b*) Other Diseases	14	5	16
Digestive System—	—	—	—
(*a*) Diarrhœa	549	257	507
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	17	3	19
Congestion of Liver	1	—	1
(*d*) Abscess of Liver	—	—	—
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	3	—	3
(*g*) Cirrhosis of Liver	—	—	—
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	427	60	440
Ear	9	1	10
Eye	296	1	319
Generative System—			
Male Organs / Female Organs	248	5	263
Lymphatic System	127	—	130
Nervous System	509	81	707
Nose	—	—	—
Organs of Locomotion	81	2	84
Respiratory System	335	59	343
Skin—	—	—	—
(*a*) Scabies	—	—	—
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	58	—	61
(*f*) Other Diseases	969	—	976
Urinary System	31	8	33
Injuries, General, Local—	753	40	796
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	—	—	—
Parasites—	303	—	318
Ascaris lumbricoides	14	—	14
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	—	—	—
Tape-worm	—	—	—
Poisons—			
Snake-bites	—	—	—
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	78	—	79
Surgical Operations—			
Amputations, Major	2	—	3
,, Minor	2	—	2
Other Operations	14	—	14
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

Colonial Medical Reports.—No. 15.—The Straits Settlements (*continued*).

RETURN OF DISEASES AND DEATHS IN 1902-1903, AT THE FOLLOWING INSTITUTIONS :—

General, Pauper, Lock, Prison, Quarantine Camp, European Small-pox, Balik Sulan, Leper Asylum, and Lumut Hospitals.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	38	—	39
Anæmia	156	30	166
Anthrax	—	—	—
Beri-beri	272	82	319
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	50	—	50
Cholera	3	2	3
Choleraic Diarrhœa	—	—	—
Congenital Malformation	—	—	—
Debility	278	113	295
Delirium Tremens	1	1	1
Dengue	—	—	—
Diabetes Mellitus	—	—	—
Diabetes Insipidus	—	—	—
Diphtheria	—	—	—
Dysentery	129	50	132
Enteric Fever	18	6	19
Erysipelas	3	—	3
Febricula	19	—	19
Filariasis	—	—	—
Gonorrhœa	88	—	90
Gout	—	—	—
Hydrophobia	—	—	—
Influenza	—	—	—
Kala-Azar	—	—	—
Leprosy	262	93	519
(*a*) Nodular	—	—	—
(*b*) Anæsthetic	—	—	—
(*c*) Mixed	—	—	—
Malarial Fever—			
(*a*) Intermittent—	625	1	639
Quotidian	—	—	—
Tertian	—	—	—
Quartan	—	—	—
Irregular	—	—	—
Type undiagnosed	—	—	—
(*b*) Remittent	55	41	56
(*c*) Pernicious	—	—	—
(*d*) Malarial Cachexia	8	2	8
Malta Fever	—	—	—
Measles	5	—	5
Mumps	5	—	5
New Growths—			
Non-malignant	17	2	17
Malignant	1	—	1
Old Age	26	19	30
Other Diseases	—	—	—
Pellagra	—	—	—
Plague	1	1	1
Pyæmia	—	—	—
Rachitis	—	—	—
Rheumatic Fever	1	—	1
Rheumatism	160	—	177
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	1	1	1
Septicæmia	1	—	1
Sleeping Sickness	—	—	—
Sloughing Phagedæna	35	16	36
Small-pox	141	26	151
Syphilis—	—	—	—
(*a*) Primary	157	—	177
(*b*) Secondary	496	31	586
(*c*) Tertiary	—	—	—
(*d*) Congenital	—	—	—
Tetanus	6	5	6
Trypanosoma Fever	—	—	—
Tubercle—	—	—	—
(*a*) Phthisis Pulmonalis	—	—	—
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculous Disease of Bones	—	—	—
Other Tubercular Diseases	—	—	—
Varicella	—	—	—
Whooping Cough	1	—	1
Yaws	—	—	—
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	103	2	107
Circulatory System—			
(*a*) Valvular Disease of Heart	31	18	31
(*b*) Other Diseases	3	—	4
Digestive System—			
(*a*) Diarrhœa	527	203	538
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	4	1	5
Congestion of Liver	4	—	4
(*d*) Abscess of Liver	3	2	3
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	2	1	2
(*g*) Cirrhosis of Liver	41	22	44
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	1	1	1
(*j*) Other Diseases	117	5	121
Ear	10	—	10
Eye	129	—	164
Generative System—			
Male Organs	105	1	109
Female Organs	24	—	28
Lymphatic System	97	—	100
Nervous System	230	18	254
Nose	3	—	3
Organs of Locomotion	36	1	44
Respiratory System	409	156	433
Skin—	—	—	—
(*a*) Scabies	—	—	—
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	29	—	30
(*f*) Other Diseases	607	2	655
Urinary System	55	18	57
Injuries, General, Local—	518	8	529
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	—	—	—
Parasites—	358	—	403
Ascaris lumbricoides	14	—	14
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	1	—	1
Tape-worm	—	—	—
Poisons—			
Snake-bites	—	—	—
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	30	3	30
Surgical Operations—			
Amputations, Major	—	—	—
,, Minor	—	—	—
Other Operations	30	7	32
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	5	—	6

RETURN OF DISEASES AND DEATHS IN 1903, AT THE

District Hospitals, Butterworth, Bukit Mertajam, and Sungei Bakap, Province of Wellesley.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	5	—	5
Anæmia	100	41	109
Anthrax	—	—	—
Beri-beri	60	24	65
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	—	—	—
Cholera	-	—	—
Choleraic Diarrhœa	—	—	—
Congenital Malformation	—	—	—
Debility	61	16	66
Delirium Tremens	—	—	—
Dengue	—	—	—
Diabetes Mellitus	—	—	—
Diabetes Insipidus	—	—	—
Diphtheria	—	—	—
Dysentery	32	16	34
Enteric Fever	—	—	—
Erysipelas	—	—	—
Febricula	62	—	62
Filariasis	—	—	—
Gonorrhœa	17	—	17
Gout	—	—	—
Hydrophobia	—	—	—
Influenza	—	—	—
Kala-Azar	—	—	—
Leprosy	13	—	13
(*a*) Nodular	—	—	—
(*b*) Anæsthetic	—	—	—
(*c*) Mixed	—	—	—
Malarial Fever—	41	5	41
(*a*) Intermittent—	6	—	6
Quotidian	—	—	—
Tertian	—	—	—
Quartan	—	—	—
Irregular	—	—	—
Type undiagnosed	—	—	—
(*b*) Remittent	2	2	2
(*c*) Pernicious	—	—	—
(*d*) Malarial Cachexia	2	—	2
Malta Fever	—	—	—
Measles	—	—	—
Mumps	—	—	—
New Growths—			
Non-malignant	—	—	1
Malignant	1	1	1
Old Age	2	—	3
Other Diseases	6	1	6
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	—	—	—
Rachitis	—	—	—
Rheumatic Fever	—	—	—
Rheumatism	74	—	80
Rheumatoid Arthritis	2	—	2
Scarlet Fever	—	—	—
Scurvy	—	—	—
Septicæmia	—	—	—
Sleeping Sickness	—	—	—
Sloughing Phagedæna	5	3	5
Small-pox	22	5	22
Syphilis—			
(*a*) Primary	5	—	5
(*b*) Secondary	62	3	65
(*c*) Tertiary	4	1	4
(*d*) Congenital	—	—	—
Tetanus	—	—	—
Trypanosoma Fever	—	—	—
Tubercle—	5	—	5
(*a*) Phthisis Pulmonalis	—	—	—
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculous Diseases of Bone	—	—	—
GENERAL DISEASES—*continued.*			
Other Tubercular Diseases	—	—	—
Varicella	—	—	—
Whooping Cough	1	—	1
Yaws	1	—	1
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	24	2	25
Circulatory System—	—	—	—
(*a*) Valvular Disease of Heart	10	2	10
(*b*) Other Diseases	13	4	13
Digestive System—	—	—	—
(*a*) Diarrhœa	99	47	105
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	—	—	—
Congestion of Liver	—	—	—
(*d*) Abscess of Liver	2	—	2
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	—	—	—
(*g*) Cirrhosis of Liver	24	16	25
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	52	8	52
Ear	6	—	7
Eye	33	—	34
Generative System—			
Male Organs	27	—	27
Female Organs	8	—	8
Lymphatic System	24	—	26
Nervous System	25	9	30
Nose	—	—	—
Organs of Locomotion	20	1	21
Respiratory System	60	24	66
Skin—	—	—	—
(*a*) Scabies	8	—	10
(*b*) Ringworm	1	—	1
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	14	1	14
(*f*) Other Diseases	181	—	198
Urinary System	21	5	21
Injuries, General, Local—	—	—	—
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	157	4	153
Parasites—	—	—	—
Ascaris lumbricoides	—	—	—
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	—	—	—
Tape-worm	—	—	—
Poisons—	53	—	53
Snake-bites	—	—	—
Corrosive Acids	—	—	—
Metallic Poisons	-	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	—	—	—
Surgical Operations—			
Amputations, Major	1	—	1
,, Minor	—	—	—
Other Operations	14	1	14
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

Colonial Medical Reports.—No. 16.—TRINIDAD.

MEDICAL REPORT FOR THE YEAR 1904-5.

By Dr. JAMES A. De WOLF,

Surgeon General.

MEDICAL.

Government Medical Officers.

The usual return respecting medical officers, the nature of their employment, and the amount of leave taken by them during the year is contained in Appendix A.

The following changes occurred in the medical staff:—

Dr. T. G. D. Cooper, supernumerary surgeon at the Colonial Hospital, resigned on June, 8th 1904.

Dr. Hormasji, who was temporarily employed as assistant surgeon at the San Fernando Hospital, resigned on May 31st, 1904.

Dr. Steward, appointed as supernumerary surgeon on special terms at the Colonial Hospital, Port-of-Spain, resigned on November 14th, 1904.

Dr. W. H. Meyer, supernumerary medical officer, resigned on March 4th, 1905, on account of ill-health.

Dr. E. J. Hammond, the senior medical officer of the Service, retired on pension on July 8th, 1904, after thirty-three years of faithful and efficient service.

Dr. F. A. Rodriguez was appointed to act as subsidised medical officer of Santa Cruz, from July 1st, 1904.

Dr. K. N. A. Inniss was appointed a supernumerary medical officer on August 16th, 1904.

Dr. A. Milner, District Medical Officer of Mayaro, died on November 22nd, 1904.

Dr. Charles Howatson acted as supernumerary medical officer from December 14th, 1904, to the end of the year.

Dr. Vilain acted for short periods to replace officers on sick leave.

No appointment has been made to the vacancy in the South Naparima District, the work of which has continued to be performed by the District Medical Officers of the adjoining districts of North Naparima and Oropuche.

On September 9th, 1904, Dr. Meyer, who was temporarily in charge of the Pointe-Pierre district, was obliged to take sick leave, and from that date until the end of the year the work of the district has been performed by Dr. Boucaud, District Medical Officer, Couva, in addition to his proper duties. Owing to the serious illness of Dr. Hewlett, District Medical Officer, Cedros, and the insufficiency of the medical staff, Dr. Guiseppe, subsidised Medical Officer of the Erin-Guapo district, was on September 18th, 1904, placed in charge of the combined districts of Cedros and Erin-Guapo, and has continued to discharge these double duties up to the present time.

Surgeon-General's Office.

There was no change in the staff during the year.

Medical Attendance on the Poor.

There was a gratifying decrease in the number of patients in Port-of-Spain, the attendance being 21,810, as compared with 28,686 the previous year.

The expenditure for medical comforts issued to the destitute also shows a considerable decrease, amounting in Port-of-Spain to £198 5s. 11d., as compared with £312 5s. 10d. the previous year, and £255 13s. 10d. for the Colony, as compared with £376 10s. 3d.

PUBLIC HEALTH.

A.—Remarks on the Prevalence of Certain Diseases.

Malarial fevers were, on the whole, not so prevalent as usual, and the type of the disease was, generally speaking, mild. Several of the District Medical Officers note a greater prevalence of malaria during the dry months of the year.

Two cases of hæmoglobinuric fever, with one death, occurred in Trinidad (Cedros and Mayaro), and ten cases, with two deaths, in Tobago.

The Tobago Medical Officers refer to the insanitary conditions due to the abandonment of many sugar estates and the consequent neglect of drainage as a cause of the extensive prevalence of malaria.

Dr. Robinson, District Medical Officer, No. 4 District, again draws special attention to the necessity, in the interests of the health of the neighbourhood, of having the Betsy Hope Swamp drained.

In the Colony generally, bowel complaints were less prevalent and of less severe type than in former years.

There was an outbreak of dysentery at Siparia in March, which assumed the form of a rather severe epidemic.

This was attributed by the District Medical Officer to contamination of the drinking water. It was the subject of a special investigation, and it is hoped that a source of water supply free from contamination will be found.

There were limited epidemics of—

Influenza, at Arima in February, Guaracara in May and June, North Naparima in January and March. Sporadic cases from time to time at St. Joseph, Diego Martin and Bocas.

Whooping Cough, at Arima from December to March, Toco from May to August, Gran Couva from June to July, Guaracara in June, Cedros from September to December.

The disease was of a mild type and generally unattended by sequelæ.

Varicella.

There was a considerable prevalence in Tacarigua of varicella from April to June, and from April to March, the total number of cases amounting to 68. There were also a few sporadic cases in St. Joseph, Indian Walk and Port-of-Spain, from time to time. It is worthy of note that a large proportion of these cases occurred among adults. With regard to the nature of the disease, however, there was no doubt whatever.

Still Births.

The District Medical Officers of the several districts call attention to the large number of still births, which they attribute to the absence of trained midwives and the ignorance and incompetence of those who officiate in that capacity. The most practical remedy for this state of things would seem to be the offering of a small subsidy by the Government to induce licensed midwives to reside in certain country districts.

Yaws.

Trinidad.—The returns of cases treated in the dispensaries and hospitals are appended.

The number under treatment in the District Dispensaries at the end of the year was 204 as compared with 304 the previous year, being a decrease of 100.

The Arima Yaws Hospital was closed at the end of June.

The total number of cases remaining in hospital and dispensaries at the end of the year shows a decrease of 100.

The number of cases under treatment at the St. Augustin Yaws Hospital at the end of the year was 222.

The total number treated during the year in dispensaries and hospitals shows an increase of 137.

This showing is certainly not as encouraging as I had hoped for. It is, however, to be mainly attributed to the large number of cases brought to light in the Indian Walk district. This is a district of large area, with a scattered population and many isolated villages, and until the year under review searching has been imperfectly carried out.

Dr. C. B. Reid, District Medical Officer of Indian Walk, remarks in his report :—

"The question as to whether yaws is on the increase or not in this district is a difficult one for me to answer at present. I am inclined to think it is not. The apparent increase, as seen from the return, I put down to the excessive zeal displayed by the yaws searcher and the serious and systematic manner with which the subject has been dealt with during the year. The whole district has practically been scoured, and few, I believe, have escaped notice."

All the severe cases were sent to hospital. There is no question as to the good effect of hospital treatment in this disease. This is illustrated by the fact that, of 238 from the Indian Walk District treated in hospital 9 recurred, whereas, of 215 treated in the district 92 recurred. It is the general consensus of opinion among District Medical Officers that the type of the disease is becoming less severe.

Tobago.—At the end of the year the total number of cases remaining under treatment in the hospitals and dispensaries was 466, being an increase of 140 over the previous year. The total number of cases treated during the year was 891, as against 1,037 the previous year, being a decrease of 146. About the middle of the year there was a marked falling off in the number of cases reported. On enquiry I found that this seemed to be largely attributable to the fact that, as the cases became fewer and more scattered in the districts, the labour of searching increased, and it appeared that the one shilling allowed for each case was insufficient incentive to thorough searching. On my recommendation the fee was increased to two shillings, as paid in Trinidad, and as the result of this and the prosecution of delinquents, the number of cases reported again increased considerably.

The District Medical Officers, however, agree in the opinion that there has been a marked decrease in the prevalence of the disease.

Tuberculosis.

This disease continues to prevail extensively in the Port-of-Spain and the country districts, although the mortality for the past year shows a slight decrease. Temporary provision is being made at the Colonial Hospital for the isolation of cases suffering from tuberculosis pending the erection of suitable wards.

It is very gratifying to note that an Association has been formed in the Port-of-Spain for the prevention and treatment of tuberculosis, and that the public, as far as there has been an opportunity to judge, have shown their sympathy with the movement and have indicated a willingness to contribute to its support. Premises have been secured for the purpose of establishing a dispensary for the treatment of such cases, which it is expected will be opened shortly.

It is the aim of the Association, should sufficient support be forthcoming, at a later date to establish a sanatorium for consumptives.

B.—Conditions Affecting the Public Health.

Water Supply.—The District Medical Officers of Manzanilla, Gran Couva, Guaracara, Indian Walk, Oropuche and Erin-Guapo call special attention to the defective water supply, drinking water being generally derived from ponds and pools in the river-beds. There is no doubt that a large proportion of the ill-health prevailing, more especially in the dry season of the year, in these districts, is attributable to this cause, and it is very desirable that some provision be made by the Government, in the centres of population, for storing rain-water, as has been done in Couva, Chaguanas, Morugo and La Lune.

The progress made in installing the sewerage system in Port-of-Spain has been slow. When certain amendments have been made to the Ordinance it is

the intention of the authorities to put in force the compulsory measures therein provided.

The only places in the country districts where improvement in sanitary conditions is noted by the medical officers are at St. Joseph and Cedros, where there have been extensions of concrete drainage.

The subjoined annexures by the Assistant Medical Officer of Health are appended :—

A.—Précis of the health reports received from the District Medical Officers.

B.—Summary of Mortality in Port-of-Spain.

C.—Report of Infantile Mortality in Port-of-Spain.

INSTITUTIONS.

Colonial Hospital, Port-of-Spain.

The work of the hospital continued to be very much hampered by the insufficiency of the medical staff, owing to the resignation of Drs. Cooper and Steward, and the necessity for the employment of several of the other members to supply vacancies in the medical districts.

The sewering of the main block and three of the other wards has effected a great and much needed improvement. It is hoped that the system will be extended to the other wards at an early date.

San Fernando Hospital.

The central administration block was completed on January 31st and affords much needed accommodation.

The conversion of the old dispensary and clerk's office into private wards, as suggested by the resident surgeon, would supply a much felt want and, as pointed out by him, help to relieve the overcrowding on the male side.

The new operation room in connection with the female wards and an isolation ward have been approved, and will be constructed this year.

District Hospitals.

Couva Hospital was closed for repairs from August 8th to November 30th. A new mortuary and out-patient room were built.

Tobago Hospital.—A new building has been erected giving accommodation for the matron's quarters on the upper floor and ten almshouse inmates below. The main building has been altered internally so as to provide room for 16 male and 16 female patients. The entire accommodation of the institution by these alterations and additions will be increased from 25 to 52 beds; only 10 of the additional beds, however, will be occupied this year.

Lunatic Asylum.

The report of the medical superintendent is appended.

The number of admissions was the highest since the opening of the asylum. It is worthy of note that nearly 50 per cent. of these patients were of foreign birth.

Dr. Seccombe again calls attention to the overcrowding, there being at the end of the year 117 patients in excess of the accommodation. It is hoped that the completion of the ward at the House of Refuge for imbecile and senile cases, and an observation ward at the Colonial Hospital, will afford sensible relief.

Provision has been made also in the estimates for the erection of a portion of the new buildings required at the asylum during the current year.

The tank which received the slop water of the institution has been connected with the main sewer in St. Ann's Road, thereby remedying the nuisance formerly caused by the discharging of its overflow into the Dry River. It is much to be desired that the sewerage system should be completely installed.

Leper Asylum.

There was an increase in the number of inmates at the end of the year of 24. The appointment of a male steward and night watchman has done much to facilitate the administration and improve the discipline of the institution, and since the enclosing of the grounds there have been fewer cases of absconding.

The water supply is still very inadequate. It is hoped that this deficiency will be remedied in the near future.

The male side is becoming overcrowded, and provision will have to be made in the coming year for increased accommodation.

House of Refuge.

The number of inmates at the end of the year showed only a slight increase over the previous year.

It is satisfactory to note that a larger amount of work was done by the inmates, resulting in a profit of $220.54 to the institution.

Quarantine.

During the year the quarantine authority held four meetings.

Sixty-three vessels, with crews numbering 2,439 sailors and 1,041 passengers coming from infected ports, were dealt with under the provisions of the Ordinance.

The amount received for rent of the islands was £215 17s. 1d.

The expenditure incurred in connection with quarantine amounted to £236 1s. 8d.

The result of the Inter-Colonial Quarantine Conference which met at Barbados in April, 1904, was eminently satisfactory, regulations in accordance with modern sanitary science and preventive medicine having been unanimously agreed upon, as also a convention to be submitted for adoption by all the Colonies concerned. It is expected that Ordinances in conformity with these recommendations will shortly be enacted in the various Colonies.

Immigration.

The accompanying digest shows the prevalence, and the incidence on estates, of the chief diseases treated among indentured immigrants.

Prevalence of Disease.—During the year 22,992 cases were treated in the Estate Hospitals, as compared with 27,637 last year, showing a decrease of 4,645 cases.

Malarial fever caused the largest number of admissions to the Estate Hospitals. This disease was generally of a benign type, and occurred mainly on estates in districts (*i.e.*, Oropuche and Couva) in which the natural conditions are most favourable to the causation and spread of it.

Dysentery was somewhat more prevalent than last year. The numbers of cases for the last five years have been 642, 1,059, 948, 667, and 766.

Anæmia and ankylostomiasis shows a total of 1,933, being an increase of 206 cases over last year. As yet no practicable measures have been discovered for reducing the prevalence of this disease.

Of diseases of a communicable type there were :—

Measles	...	...	...	1 case
Influenza	...	...	...	69 ,,
Erysipelas	...	...	...	4 ,,
Tubercle	...	...	...	7 ,,
Syphilis	...	...	...	222 ,,
Yaws ...	...	...	...	10 ,,
Leprosy	...	...	...	4 ,,

Incidence of Disease.—The chief incidence was on the Couva, Oropuche, and South Naparima group of estates. Malarial fever was responsible for the greatest number of admissions to these Estates Hospitals.

———

PRECIS OF THE HEALTH REPORTS RECEIVED FROM THE DISTRICT MEDICAL OFFICERS OF THE COLONY.

By Dr. J. R. Dickson.

Assistant Medical Officer of Health.

Port-of-Spain.—The health of the town was good. Sporadic cases of enteric fever and dysentery occurred from time to time. There were two cases of diphtheria in Tranquillity. "Cases of malarial fever were not only less frequently met with, but were of a distinctly less severe type."

Diego Martin.—Apart from a few cases of catarrhal affection, simulating influenza, there was no disease of an unusual nature. A few cases of yaws came under treatment; the type of the disease was less severe than in former years.

Santa Cruz.—The health of the district has been good. Malarial fever, generally of a mild type, was the most prevalent disease. The District Medical Officer calls attention to the excessive number of still births, and attributes a large proportion of these deaths to ignorance and carelessness.

St. Joseph.—Except a few cases of varicella in the month of February, and some sporadic cases of influenza, there has been no disease of an unusual nature. Malaria and anæmia were the most prevalent diseases.

The water supply is good and ample. The drains of the town (St. Joseph) are being concreted.

Tacarigua.—The health of the district has been good. Chicken-pox was epidemic from April to June, and from January to March, a total of sixty-eight cases occurring. The disease was of a mild type. Tuberculosis continues somewhat prevalent. The district medical officer notes: "I wish to draw special attention to the condition about and around the standpipes, so filthy are they allowed to become, and . . . to remain."

Arima.—The health of the district was fairly good. Whooping cough became epidemic in December and continued to the end of March; bronchitis and pneumonia occurred as complications and sequelæ and caused many deaths. Influenza was epidemic in February; digestive diseases and convulsions (in children) were frequent complications. There were no cases of typhoid fever, and a few cases only of dysentery.

The District Medical Officer directs attention to the large number of still births and the high infantile mortality.

The water supply of Arima is ample and excellent.

Manzanilla.—The general health of the district was better than in the previous year. Malarial fever was rather prevalent during the third quarter. Many cases of influenza, and acute lung diseases, occurred in January and February. The yaws returns show a steady diminution in the number of cases of the disease. The water supply continues defective.

Mayaro.—The health of the district has been fairly good. Malarial fever of a benign type was the most prevalent disease, and occurred principally in December and January. Two cases only of yaws came under treatment, one of which was a very recent arrival from Grenada.

Toco.—The health of the district has been good. Whooping cough, of a mild type generally, was prevalent from May to August. In November and December there were several cases of pneumonia.

Chaguanas.—The health of the district was fairly good. "Malaria and anæmia were the most prevalent diseases. Ten cases of pneumonia, four of which were fatal, occurred at Union Village in the month of February.

Couva.—The health of the district has been exceptionally good. Mild cases of malarial fever occurred as usual, but there were very few cases of bowel complaint, especially dysentery.

Pointe-a-Pierre.—The health of the district was good. Malarial fever of benign type was the most prevalent disease.

Gran Couva.—The health of the district has been good. Whooping cough was prevalent in June and July. Cases of malarial fever have been fewer than in former years.

With reference to the water supply, the District Medical Officer notes: "There is a stand-pipe in the village street which is useful in the wet season, but is useless in a drought, as the supply fails in three or four days.

Guaracara.—The health of the district was fairly good. Diseases of a communicable type occurred with the following distribution:—

Dysentery in May and July.

Influenza, of mild type, in May and June, with, in many cases, pneumonia as a sequela.

Diphtheria, one case in August.

Typhoid fever in August, September, October, November, January and February—in all a total of fifteen cases.

Whooping cough in June.

Dysentery was much less prevalent.

The months of highest mortality were August, February and March.

The water supply continues defective, being obtained generally from surface wells and pools in the river-beds.

Princes Town.—The health of the district was good—one case only of enteric fever occurred during the year.

Indian Walk.—The health of the district was good. There was no epidemic prevalence of disease.

Malaria fever, of a benign type generally, was the most prevalent disease.

The month of highest mortality was August.

With regard to water supply, the District Medical Officer notes: "Artificial ponds, a few muddy rivers, and a few springs form the chief water supply."

Two concrete cisterns have been built—one at Moruga, the other at La Lune.

North Naparima.—The health of the district was good. The most prevalent diseases were anæmia, malarial fever, and, during the last quarter of the year, influenza.

Oropuche.—The health of the district showed an improvement over last year.

Malarial fever was the most prevalent disease.

The District Medical Officer remarks: "The district was remarkably free from dysentery until the last month of the year, when a rather severe epidemic broke out in Siparia," apparently traceable to the contaminated water supply. "The water is still derived chiefly from open ponds or from streamlets near the villages, and these are constantly liable to serious contamination.

Cedros.—The health of the district has been fairly good.

Malarial fever was as usual the most prevalent disease, and caused many deaths. One non-fatal case was of hæmorrhagic type.

Whooping cough, confined to Icacos, occurred during the third quarter.

Dysentery prevailed generally to a slight extent.

The District Medical Officer remarks upon the large number of still births, and the high mortality among persons not attended by the medical officer.

Under "causes and conditions affecting the public health" the District Medical Officer notes: "Concrete drainage is almost general in the streets of Beaulieu Village, which is the principal village in the district, and much has been done to improve the natural insanitary conditions of the place and the environs. The water supply is neither good nor abundant, being obtained from ponds, springs, or hills, which are liable to pollution."

Erin-Guapo.—The health of the district showed no improvement over last year. The greatest amount of sickness occurred during the fourth quarter of the year, and this was also the period of maximum mortality. There has been no improvement in the water supply, and the District Medical Officer again urges the necessity for a concrete cistern for the storage of rain-water in St. Francique, the principal village of Erin.

Tobago, Nos. 1 and 2.—The health of the district generally was good. Malarial fever of a mild type was unusually prevalent during December and January.

The District Medical Officer notes: "There were six cases of hæmoglobinuric fever, of which one ended fatally; this one being the only native of Tobago among the six cases, and the temperature in this case rising to 108·4° F. before death."

The water supply is very fair. "The natural springs which are to be found in many places have all been attended to by the Warden's Department, and afford a fair supply of good water to the various villages and settlements in the country districts."

Tobago, No. 3 District.—The health of the district was fairly good. There was no epidemic prevalence of disease.

The diseases most prevalent were endocarditis, malarial fever, intestinal worms and malnutrition.

Malarial fever, of benign type generally, was rather prevalent—an incidence attributed to the large amount of land which has gone out of cultivation.

Three cases of hæmoglobinuric fever, one of which proved fatal, occurred.

The District Medical Officer again directs attention to the hardships entailed on the inhabitants of the district by the limited accommodation of the Scarborough Hospital.

Tobago, No. 4 District.—The health of the district was good. There was no unusual prevalence of any disease. Malarial fever—of mild type—was more than usually prevalent. One case of hæmoglobinuric fever came under notice.

The District Medical Officer again refers to the large number of rodent and specific ulcers, and to the necessity for the hospital treatment of these cases. Under "conditions affecting the public health," the District Medical Officer remarks: "I would again point out that it is a matter of great regret that certain large swamps, *e.g.*, Betsy's Hope Lagoon, could not be drained as of yore, and thus ensure from its pestilential odour, and certainly its malarial breeding possibilities, the wide area adjoining. I am glad to record something in the nature of individual effort in this direction by the owner of Kendal Place Estate."

TABLE OF MONTHLY MORTALITY.

Month	Male	Female	Nos.	Rate per 1,000
April	70	61	131	26·64
May	66	52	118	24·
June	81	65	146	29·69
July	86	70	156	31·73
August	95	62	157	31·93
September	75	73	148	30·10
October	88	66	154	31·32
November	71	52	123	25·02
December	80	64	144	29·28
January	66	58	124	25·22
February	63	46	109	21·8
March	67	61	128	25·6
Total	908	730	1,638	

Summary of Mortality in Port-of-Spain for the twelve months ended March 31st, 1905.

	M.	F.	Total.
No. of Deaths of Residents	908	730 =	1,638
Death Rate	—	—	27·76
Death Rate for twelve months ended March 31st, 1904	—	—	34·2

The highest mortality occurred in August, 1904; the lowest in February, 1905.

The above Table details the monthly mortality.

The principal causes of Death were:—

	Nos.	Rate per 1,000.
All Tubercular Diseases	244	4·13
Pulmonary Tuberculosis	197	3·34
Lung Diseases (non-Tubercular) ..	87	1·47
Acute Diarrhœal Diseases	124	2· 1
Chronic Diarrhœa	7	·12
Dysentery	12	· 2
Malarial Fever	32	'54
Typhoid Fever	29	·49
Chronic Kidney Disease	73	1·24
Cardiac Disease (Organic)	66	1·12
Cerebral Hæmorrhage	2	
Whooping Cough	5	
Influenza	1	
Still Births		
Puerperal Septicæmia	5	
Leprosy	6	
Malignant Disease	22	·37
Puerperal Eclampsia	6	
Liver Abscess	3	
Croup	3	
Tropical Pemphigus	1	
Tetanus	4	
Diphtheria	1	
Erysipelas	2	

The rates are calculated for all classes of the population.

Of deaths from Pulmonary Taberculosis—19 occurred in April, 20 in September, 24 in October, 1904; and 23 in March, 1905. Of Lung Diseases (non-Tubercular), 15 occurred in May, 11 in July, and 10 in August. Of Acute Diarrhœal Diseases, 16 occurred in April and 26 in June.

Deaths from Communicable Diseases (Pulmonary Tuberculosis excepted.)

	Deaths.
Typhoid Fever	29
Whooping Cough	5
Influenza	1
Puerperal Septicæmia	5
Leprosy	6
Diphtheria	1
Erysipelas	2

REMARKS.—The months of highest mortality were July, August, and October—the maximum mortality being attained in August.

(2) Diarrhœal Diseases were most prevalent during the months of April and June.

(3) Deaths from Tubercular Diseases amounted to about one-sixth of the total deaths.

THE

Journal of Tropical Medicine

With which is incorporated "CLIMATE"

A BI-MONTHLY JOURNAL DEVOTED TO MEDICAL, SURGICAL AND GYNÆCOLOGICAL WORK IN THE TROPICS

EDITED BY

JAMES CANTLIE, M.B., F.R.C.S., W. J. SIMPSON, M.D., F.R.C.P., AND G. M. GILES, M.B., F.R.C.S., LIEUT.-COL. I.M.S. (Retd.)

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Original Communications.

IS YAWS SYPHILIS?

By ALDO CASTELLANI, M.D.
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To everyone interested in tropical medicine the theory is well known according to which yaws (frambœsia, parangi, pian, &c.) is simply a form of syphilis. This theory, supported by so high an authority as J. Hutchinson, has raised much discussion. The medical men practising in those parts of the Tropics where yaws is endemic are divided into separate camps: those who believe in this theory, and those who consider yaws to be a distinct disease. Among the latter some recognise, however, that the anti-syphilitic treatment is effective also in yaws, while others affirm that mercury and potassium iodide are quite worthless.

At the suggestion of Sir Allan Perry—to whom I am greatly indebted—I have studied several cases of yaws in Ceylon, and may be permitted, therefore, to express the conclusions to which I have myself arrived in regard to the nature of the disease. I may say at once that in my opinion yaws is not syphilis. It seems to me that the study of the geographical distribution, the clinical symptoms, and the histo-pathology show clearly the two diseases to be different.

Geographical Distribution.—At the present time syphilis is practically pandemic; yaws, on the other hand, is localised to some parts of the Tropics (Ceylon, Assam, Java, West Indies, West Africa, &c.). Yaws is extremely common in Ceylon, extremely rare in India. Syphilis is frequent in both countries.

In Samoa, according to Turner, syphilis was unknown up to at least 1880, while yaws has been endemic ever since the group was discovered. In Fiji, too, up till a few years ago syphilis was not present, while yaws was almost universal. Daniels has made the interesting observation that in British Guiana yaws in late years has disappeared, while syphilis is still rampant.

Symptoms and Course.—After an incubation period varying in length, but generally not exceeding three to four weeks, characterised often by signs of malaise, rheumatoid pains, headache, irregular rises of temperature, a *primary sore*, if it may be called so, appears at the seat of inoculation, which is generally extra-genital. I have never myself seen the primary lesion in its very first stage, as all my cases were in later periods of the disease. I have very little doubt, however, about its presence. The natives are very positive about it. Moreover, in Ceylon at any rate, they are in the habit of cauterising it themselves in a primitive way, so that a white scar remains plainly visible. This scar, which is usually of rather large dimensions, in all my cases was extra-genital; in women it was very often found on one of the mammæ, in men and children on the trunk and arms.

The primary growth at the seat of inoculation is apparently quite different from the primary sore of syphilis. From the description given by natives it would seem to appear as a rather large fungoid growth, covered with a crust, not very dissimilar from the elements of the general eruption which appears later on. This large, single, projecting tubercle is called "mother yaw" or "maman pian" in French patois. By the Samoans it is called "ta'rr" or "leader" (Turner). This primary growth may remain single for several weeks and even months. It often heals before the general eruption begins.

Before the typical general eruption of yaws begins some furfuraceous, whitish, pruriginous patches appear on the trunk and limbs. These may coalesce and cover large portions of the body. Some of them may disappear, leaving the skin without lustre and rough. Others may remain for the whole course of the disease. It is on these furfuraceous patches that according to many writers the elements of the general eruption appear; in my experience, however, these may develop also on parts of the skin absolutely normal.

The general typical eruption of yaws makes its appearance in the form of papules. These are at first small, often flattened, and with the epidermis intact. They may disappear, or more often they increase in size, become moist, and are soon covered with a crust yellowish or brownish in colour, formed of desiccated secretion; if the crust is removed a raw surface will be observed throwing up coarse red or yellowish fungoid granulations secreting a thin, slightly purulent secretion which soon dries into a crust again. These papillomatous growths are of various size, and practically may be found on any part of the body; they are extremely common on the upper and lower limbs, and on the face; very rare on the scalp. They may remain of the same appearance and size for months; often after a few weeks the secretion diminishes, and a process of hyperkeratosis sets in; they become of much harder consistency, and some of them, especially on the feet, may be covered with numerous hard, verrucose-like small protuberances.

Generally within three to six months in children, and six to twelve months in adults, the yaws dry up, shrink and disappear, leaving dark hyper-pigmented spots in their site. In some cases the eruption is very persistent and appears in successive crops; in other cases large irregular ulcers may develop showing often in their centre reddish papillomatous masses which in my experience do not usually heal spontaneously.

Constitutional symptoms of severe nature are generally absent during the whole course of the disease in ordinary cases; the physical examination of the internal organs does not reveal anything abnormal; a few superficial lymphatic glands may be enlarged, but in my experience this is not a constant feature. The analysis of urine does not present anything abnormal. The stools may contain ova of various worms, but this is also a frequent occurrence in normal natives.

The Blood.—In all my cases in which the blood was examined a certain degree of anæmia, never very severe, was present. The number of red blood corpuscles varied from 3,800,000 to 4,400,000; the hæmoglobin index (Fleish) from 60 to 75. The red blood corpuscles did not show anything abnormal in their shape. On several occasions I noticed a comparatively large number of polychromatic erythrocytes staining blue instead of pink with Leishman's method.

Many of these basophile red cells were micro-erythrocytes.

The leucocytes varied from 7,000 to 12,000 per cmm. In the majority of cases an increase was noticeable in the number of the large mononuclear, even when there was no sign and no history of malaria. In almost all the cases the eosinophiles were increased, this being due probably to the presence of intestinal worms as revealed by the microscopical examination of the stools, which showed frequently ova of *Ascaris lumbricoides*, *Tricocephalus dispar*, and, in a few instances, of *Ankylostoma duodenalis*.

I attach a table giving the results of the examination of blood in four typical cases with no history of malaria, and in which no ova of ankylostomata were found in the fæces, although eggs of other worms (*Ascaris lumbricoides* and *Tricocephalus dispar*) were present.

Case	Hæmoglobin	Red Blood Cells per c.mm.	Leucocytes per c.mm.	Differential count of Leucocytes (% without fractions)				
				Polimorphonuclear	Large mononuclear	Small mononuclear	Transition forms	Eosinophiles
1. Woman ..	65	3,900,000	11,000	46	34	9	3	7
2. Boy	70	4,000,000	9,000	41	26	25	6	2
3. Girl	60	3,800,000	7,000	64	15	11	2	8
4. Girl	65	4,100,000	10,000	52	20	15	3	10

The interesting point shown by the examination of the blood is the increase in the number of the large mononuclear leucocytes. This is of frequent occurrence, though not constant. An increase in the mononuclear has been noticed also in syphilis by several writers, it is, however, very common in many diseases of protozoal origin, as shown by Manson, &c.

From the brief clinical sketch given of yaws, it will be seen that the disease presents the following principal features in contrast to syphilis: Primary sore, if it may be so-called, generally extra-genital; eruption of one type only, viz., the papule which proliferates into a papillomatous growth; extremely well-marked pruritus. Moreover, in yaws *sequelæ* comparable to tertiary syphilis or parasyphilitic conditions are absent or extremely rare, though it must be admitted that our knowledge on this point is far from being complete. It is also to be noted that yaws is not hereditary and not congenital.

Pathology.—MacLeod, in his excellent paper on the "Histo-pathology of Yaws," calls attention to the following differential points between yaws and syphilis:—

(1) The proliferative changes in the epidermis are much more marked in yaws than in syphilis. When the yaws has reached a certain stage a well-marked hyperkeratosis is noticeable which is rare in syphilis.

(2) The blood-vessels in the yaws granulomata have no tendency to thickening, nor is there any endothelial proliferation such as occurs in syphilitic gummata.

(3) The plasma cells in yaws form a more diffuse infiltration, and retain their original type better than in any other of the granulomata.

MacLeod rightly states that these differential histological details must be considered collectively, as there is no individual histological character, which exceptionally might not be present both in syphilis and yaws.

Examining films from yaws granulomata stained by Leishman's method it is interesting to note the very large number of polychromatic red blood cells of very different dimensions; some much larger than the normal erythrocytes, others very much smaller. Sometimes these polychromatic cells have a granular appearance.

The leucocytes frequently contain in their protoplasm, and sometimes also in their nuclei, roundish or oval, more or less deeply blue-stained bodies. These I believe to be probably basophile microerythrocytes engulfed by phagocytes.

Inoculation Experiments in Man and the Lower Animals.—The experiments of Paulet and Charlouis are well known. Paulet (1848) inoculated fourteen negroes with the secretion taken from yaws granulomata. All of them developed yaws, the incubation period varying from twelve to twenty days, when at the place of inoculation in ten cases the first nodule of yaws appeared, soon followed by a typical general eruption. In two cases apparently the eruption did not start from the seat of inoculation.

The more recent investigation of Charlouis (1881) is most important. He first took four cases of yaws and inoculated them under the skin at various spots with the secretion of their own yaws: in three cases at the places of inoculation typical yaws granulomata developed. Charlouis also inoculated thirty-two Chinese prisoners—who had never suffered from the disease—with crusts and scrapings of a yaws. In twenty-eight cases the disease developed, beginning always from the seat of inoculation.

Moreover, Charlouis, to a native suffering from typical yaws, inoculated syphilis. The inoculation was quite successful, a primary syphilitic sore developing, followed by all the usual types of secondary eruptions.

That yaws patients are not immune against syphilis is proved also by Powell, who describes two very interesting cases of syphilis supervening on yaws.

The lower animals, as far as we know, are refractory to yaws. In Ceylon, I tried to inoculate an anthropoid monkey, following the technique used by Metschnikoff and Roux for syphilis. The inoculation did not succeed. It would be premature, however, to come to the conclusion that the disease cannot be inoculated into monkeys. Numerous experiments on various species of monkeys are necessary.

Etiology.—Various bacteria have been described in yaws: Eijkmann found some peculiar bacilli; Pariez observed numerous micrococci; Breda described a bacillus which he called "Boubas, or Frambœsia bacillus"; Powell, in 1896, cultivated in two cases a yeast which was present in the granuloma and also between the epithelial cells.

Nicholls and Watts, in 1899, found in the granulomata a coccus which they cultivated in pure cultures. The same coccus was found once in the lymphatic glands. Inoculation into animals did not succeed.

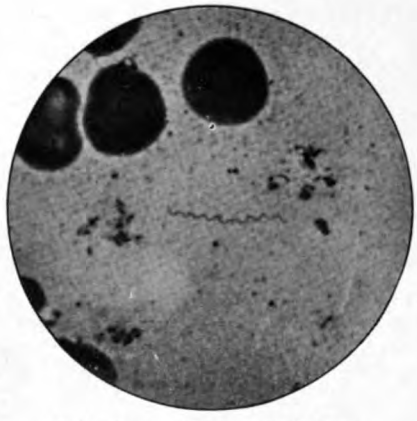
Personal Researches.—Fourteen cases of yaws were examined by me in Ceylon. In the open sores and

General eruption.

Yaws. General eruption.

General eruption

White scar at the seat of the primary growth.



Spirochæte of the *pallida* type.

Scar at place of primary growth.

To Illustrate Dr. ALDO CASTELLANI'S article, "Is Yaws Syphilis?"

fully developed yaws all sorts of bacteria were present, cocci, sarcinæ, bacilli. When the eruption elements are, however, in the very first stage, not moist, and with the epidermis intact, no bacteria, according to my experience, are found either microscopically or by culture methods; instead of that, rare spirochætæ may be observed.

A preliminary note on the presence of spirochætæ in cases of frambœsia was published on June 17th, 1905, in the *Journal* of the Ceylon Branch of the British Medical Association. Other cases of yaws showing spirochætæ have been communicated by me at the meeting of the British Medical Association, Leicester, July, 1905, and several more cases described in the *British Medical Journal*, November 18th, 1905.

Technique.—Films are made in the usual way from scrapings of the eruptions. It is advisable to select lesions in which a secondary pyogenic infection has not yet taken place. Giemsa stain, which I have used only lately, gives good results, but Leishman's method gives also very good results, if the staining is done according to the following instructions:—

(1) Let the alcoholic solution of Leishman act for five minutes without fixing the films previously.

(2) Mix the stain with equal or double amount of distilled water, and let it act for half an hour to several hours.

(3) Wash with distilled water and leave a few drops of it on the films as usual for half to one minute.

(4) Blot and examine with very high power.

Morphology of the Spirochætæ.—In non-ulcerated lesions, and sometimes also in open sores of yaws, there may be found an extremely delicate organism which morphologically, in the present state of our knowledge, I do not think can be distinguished from the *S. pallida* of Schaudinn. The organism takes up generally a pale reddish tint when stained by Leishman's or Giemsa's method. It is extremely thin, some individuals are, however, thicker and better stained than others, though always much thinner than any spirochæte of the *refringens* type. The extremities are often pointed, but possibly due to the manipulation of the film, forms may be met with presenting blunt extremities, or one extremity blunt and the other pointed. In a few individuals one of the extremities may present a rather large roundish or pear-shaped expansion.

The length varies from a few microns to 18 and 20 microns, and even more. The number of waves varies also, but they are generally rather numerous, uniform, and of small dimensions. Sometimes a portion of the spirochæte shows numerous narrow, uniform waves, while the rest of it has no waves at all. Sometimes, also, two spirochætæ may be attached together, or apparently twisted one on the other. Two organisms close together and nearly parallel, but united at one end as described in *Spirochæte pallida*, by Schaudinn, have been seen. On the minute structure of the parasite I have not any observation of importance, but in a few individuals I have observed a few chromatoid points here and there.

In rare cases, several preparations presented, besides the spirochætæ, some peculiar bodies, extremely rare. These bodies are generally oval or roundish, 5 to 8 microns in length and 4 to 6 in breadth. Sometimes they may have smaller or much larger dimensions.

In preparations stained by Leishman's method these bodies are stained slightly purplish or bluish, and contain chromatin. The chromatin may be collected at one point near one of the extremities, or scattered at several points. Whether these bodies have anything to do with a developmental stage of the spirochæte I cannot yet say.

Spirochætæ Found in Open Sores of Frambœsia.—The fungoid ulcerations are invaded very quickly by all sorts of germs. Besides innumerable bacteria, often spirochætæ of various kinds are present. One form is rather thick, and takes up easily the stain; it is morphologically identical with the *S. refringens* of Schaudinn.

Another form is thin, delicate, with waves varying in size and number, and with blunt extremities; I proposed for this variety the name of *S. tenuis obtusa.* A third form is also thin and delicate, but is tapering at both ends: I named it *S. tenuis acuminata.* The spirochætæ of the *pallida* type, as found in non-ulcerated lesions, may also be present.

Recapitulating, I have examined for spirochætæ altogether fourteen cases of yaws, the search being positive in eleven. In one case the spirochætæ of the *pallida* type were present also in films from an excised gland. The spirochætæ found in the non-open lesions and some of those found in open sores of yaws are, in my opinion, morphologically identical with the *S. pallida* of Schaudinn. This is also the opinion of Schaudinn himself who very kindly has examined several of my specimens. My observations have been recently confirmed by Wellman in one case and by Powell in another.

Even supposing that future investigations should confirm these observations, it will be by no means proved that syphilis and yaws are the same disease. The leprosy bacillus, the tubercle bacillus, and many other acid-fast bacteria are morphologically identical; however, leprosy is not tuberculosis. It is also practically impossible to distinguish morphologically the surra from the nagana trypanosome, but the two diseases are different.

I believe, that if future investigation will prove that yaws is a spirochæte disease, the yaws spirochæte will have to be considered to be biologically different from the spirochæte of syphilis.[1]

Treatment.—According to my experience there is no doubt that the anti-syphilitic treatment is effective also in yaws, although I do not deny at all that some cases may recover spontaneously. In any stage of yaws potassium iodide in *large doses* is much more effective than mercury. As there are authors who state that this treatment is useless, I kept four typical cases of yaws without any treatment for a certain time. One remained stationary, three got worse and worse. In one of these—a woman—for humanity's sake I had to give up the experiment after four weeks, numerous large fungoid ulcerations having developed. The symptom of which she complained the most and for which she was continuously begging for some remedy, was the unbearable pruritus. As soon as

[1] In such a case the name I suggested of *S. pertenuis* (June, 1905) *seu Pallidula* (November, 1905) might be a proper one.

potassium iodide in anti-syphilitic doses was administered this symptom decreased remarkably in intensity and finally disappeared, the eruption also soon getting better.

The potassium iodide cure doing good in yaws is considered as an argument in favour of the disease being a form of syphilis. The fallacy of this argument is shown by the fact that potassium iodide has a very beneficial effect on another disease quite different from syphilis, viz., actinomycosis.

Conclusions.—The clinical symptoms, the geographical distribution, the histo-pathology of frambœsia tropica show many points of difference from syphilis. The presence of a spirochæte of the *pallida* type in some cases is not sufficient, for the reasons already stated, to come to the conclusion that the two maladies are the same entity. I agree, therefore, with such authorities on yaws as Manson, Powell, Daniels, Jeanselme, Sambon, &c., that syphilis and yaws, though closely allied, are two different diseases.

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A SIMPLE AND CHEAP ROCKER FOR LEISHMAN OR OTHER STAINS.

By P. N. GERRARD, M.D.(Dublin), D.T.M.H.(Camb.).
Krian Perak, Federated Malay States.

HAVING suffered many times and oft from the "tricks" of Lieut.-Col. Leishman's excellent stain, necessity at length drove me to make the rocker of which I enclose rough diagrams, and since the adoption of which I have had the greatest comfort and infinitely better results than before I made it. The materials used by me were as follows:—

One small piece of a deal box, say 6 in. by 5 in. by $\frac{3}{4}$ in.

Four lengths of thin bamboo.

One piece of ordinary string.

Two trouser buttons.

The shot from two cartridges, or two bullets.

Two fingers of an old white glove.

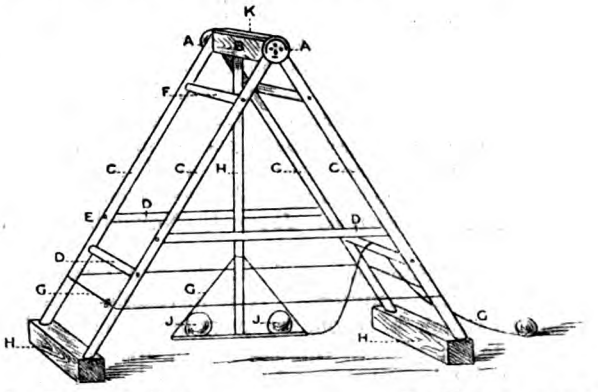
About two dozen ordinary pins and two surgical needles.

The time taken to make the machine, about an hour and a half.

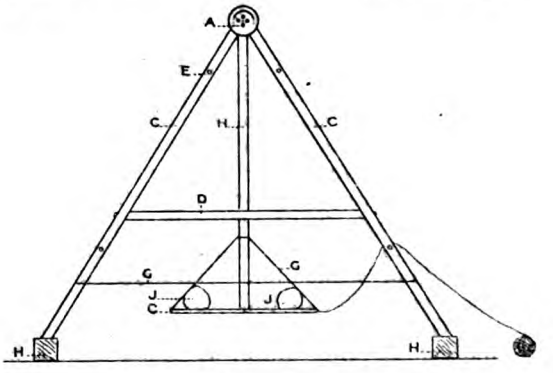
The diagrams explain the construction.

I find it works best if the stain is poured on the slide and the string then pulled, the rocking continues for about ninety minutes, depending, of course, upon the length of the supports and the weight of the shot-bags, the length in mine being 12 in., exclusive of the small square block which steadies the machine.

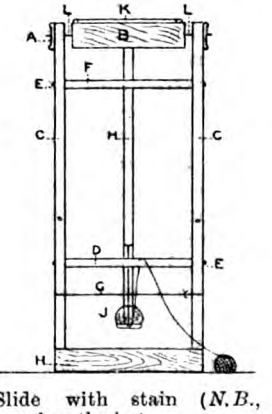
I use it on my pathology table, with two or three sheets of blotting paper under it to catch the dropping water when the stain is flushed off.

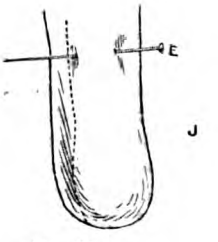


A.—Trouser button.
B.—Solid squared piece of deal.
C.—Bamboo.
D.—Bamboo spreader.
E.—Pins.
F.—Wooden spreader.
G.—String.
H.—Wood.
I.—One No. 7 split.
J.—Shot-bags.



C.—Bamboo. *J.*—Shot-bag.





K.—Slide with stain (*N.B.*, lengthwise).
L.—Surgical needle.
J.—Shot-bag.

E.—Pin.
J.—Shot-bag.

After the stain has been on about ninety minutes the rocker is almost at a standstill, and the dilution is carried out from a syphon tube (into a whisky bottle containing rain-water, filtered).

The rocking is again started and when it has slowed after the usual ninety minutes or so, another tug at the string will give another ninety minutes, and flushing can then be performed, the waste trickling down the pendulum to be absorbed by the blotting paper below. This dries in about three hours in the Tropics, and I find I have no difficulty from flooding in using the rocker three times a day, namely, for about two hours before breakfast, two hours after tiffin (one o'clock), and sometimes between 5.30 and 6.30.

I trust this may be of assistance to all who recognise the impossibility of "running" hospitals in the Tropics nowadays without a careful study of hæmic conditions.

I shall be happy to supply any further details required.

VICTORIA. MEDICAL LEGISLATION.—A Bill about to be presented to the Government of Victoria, Australia, is to the effect that no degrees will be recognised from universities other than the United Kingdom or a British possession, unless it appears to the Medical Board that such universities recognise the medical graduates of the University of Melbourne, and that Melbourne graduates are permitted to register in the country of the university. A clause is introduced prohibiting any persons but registered medical practitioners (and chemists) from dispensing medicine or rendering to any person medical or surgical aid for fee. The penalty for evading these provisions is fixed at £50.

Yellow Fever.

COLONEL WILLIAM C. GORGAS, Chief Sanitary Officer for the Canal Commission in his report for the month of August, 1905, publishes some interesting yellow fever statistics for the period from July 1st, 1904, to September 1st, 1905, a *résumé* of which is given below.

CASES OF YELLOW FEVER IN PANAMA, COLON, AND THE CANAL ZONE.

	No. of Cases	No. of Deaths	Mortality Percentage
Employees of the Canal Commission appointed from the U.S.	69	14	20·3
Employees of the Canal Commission appointed from the Isthmus ..	43	10	23·2
Employees of the Panama Railroad Company	9	2	22·2
Persons not employees of the Commission or Railroad	83	38	45·8
Transients to and from foreign ports ..	26	10	38·5

During this period 116 cases occurred in Panama, 57 cases in Colon, and 33 cases in the Canal Zone proper.

During August, 1905, there were 27 cases of yellow fever on the Isthmus.

[We are obliged to Dr. Isaac Brewer, U.S.A., for this information.—ED.]

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200 ,, ,, 7/6;
50 Copies beyond four up to eight pages, 8/6;
100 ,, ,, ,, 11/-;
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One page of the Journal equals 3 pp. of the reprint.

If a printed cover is desired the extra cost will be for 50 Copies, 5/6; 100 Copies, 6/6; 200 Copies, 7/6.

THE

Journal of Tropical Medicine

JANUARY 1, 1906.

ARRANGEMENTS FOR 1906.

TO-DAY we commence the ninth volume of the Journal. The Journal of 1905 increased in bulk considerably beyond any of its predecessors, a feature which some proprietors of journals consider a subject to be congratulated upon, but which it has been our endeavour, in view of the enormous amount of literature produced at the present day, and in the desire that the JOURNAL OF TROPICAL MEDICINE shall be read from start to finish, we have attempted to avoid. No department of medical literature has increased in amount in the same proportion as that to which the JOURNAL OF TROPICAL MEDICINE is devoted, so that it is impossible to carry out the promise with which we started, that this Journal should be one as concise as possible in order to ensure its being read.

We think it may be of interest to readers to know what arrangements have been made for the future.

The Editors have had the good fortune to secure the able services of the following medical colleagues as coadjutors in the foreign literary work of the Journal:—

T. P. BEDDOES, M.B., (Cambridge), F.R.C.S. (England), for French, Spanish and Portuguese literature.

J. CAMPBELL GRAHAM, M.A., M.D., for German and Dutch literature.

J. E. NICHOLSON, Lieut.-Col. R.A.M.C. (Rtd.), for Italian, French and Spanish literature.

We have been indebted to Lieut.-Col. Nicholson and Dr. Beddoes for the past year or two for their help and co-operation in the department of foreign literature, and it is satisfactory to know that we are to continue to be benefited by their help.

Contributors sending Articles representing really Good Original Work to be Paid.

We have long felt that original articles representing really good original work sent to the JOURNAL OF TROPICAL MEDICINE should be paid for, and we have induced the proprietors to apportion a certain sum to that end. The amount at the disposal of the Editors will not allow of anything but small payments, yet we are satisfied it is a move in the right direction, and we hope our contributors will approve of the step.

The proprietors desire we should draw attention to the conditions which have always obtained in this Journal concerning reprints. A contributor of an original article is entitled to six copies of the Journal free. Should, however, reprints be desired, notice must be sent to that effect before the article is published; a small charge is made for reprints under these conditions.

The inclusion of the Colonial Medical Reports was the most important feature of the Journal during 1905. Through the kindness of the authorities of the Colonial Office we have been permitted to publish these valuable contributions, and we hope, by our doing so, the highly important and systematic records of disease from every part of the Empire lying in tropical latitudes have proved practically useful to medical practitioners in the Tropics, and will be found reliable for reference to future statistical and epidemiological writers.

SOME POINTS OF INTEREST IN TROPICAL MEDICAL WORK DURING 1905.

SLEEPING SICKNESS.

THE members of the Sleeping Sickness Commission of the Royal Society in a summary of their work state, in the No. 4 Report by E. D. W. Greig, Captain I.M.S., their conclusions:—

"(1) That the disease is at first a specific polyadenitis caused by the *Trypanosoma gambiense*.

"(2) That, in addition to enlargement of lymphatic glands, the blood shows a constant lymphocytosis at all stages of the disease.

"(3) That sleeping sickness is the last stage of this disease, and is invariably fatal. It consists, essentially, in a polyadenitis, plus signs and symptoms due to changes in the nervous system; the onset of these signs and symptoms synchronises with the entrance of the *T. gambiense* into the lymph spaces of the nervous system; this is accompanied by a rise of the mononuclear elements in the cerebro-spinal fluid.

"(4) That the resistance of both men and monkeys to the *T. gambiense*, as judged by the duration of the early stage, varies greatly, and probably a certain proportion, not yet exactly determined, acquire sufficient immunity to arrest the development of the disease at that stage.

"(5) That the action of arsenic *in vita* on the *T. gambiense* is partial. It destroys a number of the trypanosomes, and probably these act as immunising agents. Its administration in the stage of polyadenitis tends to help the natural resistance to combat the disease.

"(6) That bacterial invasion, chiefly coccal, occurs in some cases, but only in the very last days of the sleeping sickness stage, and therefore cannot determine the onset of this phase of the malady.

"(7) That, in addition to the *T. gambiense*, other varieties of trypanosoma occur in Uganda, which are pathogenic to animals.

"(8) That these trypanosomes differ entirely from *T. gambiense* in morphology and animal reactions.

" (9) That one of these trypanosomes is probably identical with *Trypanosoma brucei*. The other two differ from it, and are, provisionally, unclassed.

" (10) That these varieties of trypanosomes are conveyed from the sick to the healthy by the Uganda tsetse-fly (*G. palpalis*), and not by other biting flies (*Stomoxys*)."

It appears that the lymphatic glands of every case of sleeping sickness are enlarged, and the juice taken by puncture during life contains many active trypanosomes, and also disintegrating forms. In so-called " trypanosoma fever " the same conditions and findings obtain. It was also determined that lymphocytosis occurs in all cases of sleeping sickness. The cells met with in the cerebro-spinal fluid of the sleeping sickness cases taken during life by lumbar puncture are lymphocytes, and these are more numerous in the late stages of the disease. The presence of a diplostreptococcus in various tissues and fluids, which for some time has excited discussion as to the part it plays in sleeping sickness, seems to have been proved to have no etiological significance; but is quite a late development in the disease when it does appear, which is not always the case. All the evidence goes to show that the trypanosoma derived from the blood of early cases of sleeping sickness, and those derived from the cerebro-spinal fluid of advanced cases of the disease are one and the same, namely, the *T. gambiense*.

The tsetse-fly, the *Glossina palpalis*, seems to be the medium of transmission; and this fly, when infected, can communicate the disease to monkeys as well as to men. Trypanosomes occur in animals such as oxen, ponies, camels, dogs and mules, in the area in which the Commission was at work; but it was impossible on morphological grounds alone to arrive at a final conclusion as to the identity or otherwise of the various " strains " met with in different animals, but there can be no doubt that the *T. gambiense* differs morphologically from the animal varieties. By inoculation experiments, however, there would appear to be a marked distinction in the behaviour of the several trypanosomes met with in animals.

Lieutenants A. C. H. Gray and F. M. G. Tulloch report several observations made on tsetse-flies. They proved that the *T. gambiense* multiplies in the alimentary canal of the *G. palpalis*, and that the trypanosomes undergo morphological change in the fly. Trypanosomes taken from the intestine of the fly did not infect monkeys, but the salivary glands of the fly were seen to be occupied by trypanosomes from the intestines of the fly.

Of noted lesions in sleeping sickness the only one which seems to have been recently added is a petechial hæmorrhage in the mucous membrane of the stomach.

As regards treatment, arsenic—as sodium arseniate, as Fowler's solution, or the combination of the former with trypanroth or atoxyl, seem the only drugs which have so far given even partially beneficial results.

Malaria.

Of the several forms of prophylaxis, quinine, mosquito netting and destruction of mosquito breeding grounds, each has its advocates. The Italian Commission for the study of malaria found quinine most effective in preventing relapses of attacks of fever and in restoring the patients to health. The members of the Commission found 6 grains to adults daily, and 3 grains to children, were efficacious in preventing new infections and in preventing relapses of illness.

The objection to quinine taking is the difficulty of getting patients or persons exposed to malaria to continue using the drug, except under the strictest supervision. The same may be said of protection by mosquito netting; apathy on the part of the persons exposed to malaria is the great drawback to the complete success of mechanical protection from mosquitoes; but where supervision was possible, as in the case of the Corsican Anti-malarial League, mosquito netting proved highly, in fact completely, efficacious. Destruction of Anopheles' breeding grounds as a prophylactic agent did not find favour to any great extent in Italy, owing to the difficulty of draining the large swampy areas where mosquitoes breed. In several parts, however, this mode of exterminating malaria has given excellent results,

one of the best, perhaps, being that obtained at Klang and Port Swettenham, in the Malay States, by Dr. Malcolm Watson. In a district where eradication seemed at first sight well-nigh impossible, Dr. Watson practically exterminated malaria by systematic drainage of mosquito breeding places, and by clearing the immediate neighbourhood of shrubs and secondary jungle-growth. At Port Swettenham, during the years 1901-02-03-04, the first-mentioned year being previous to anti-malarial measures, the cases of malaria numbered 188, 70, 21 and 4.

In both Klang and Port Swettenham, malaria, as a fatal disease, was reduced to *nil*, and as a factor in illness wholly insignificant. Major Ross's work at Ismailia in the same direction gave, and continues to give, most encouraging results. In 1901, before anti-malarial measures were tried in Ismailia, there were 1,990 cases of malarial fever in the town; in 1903 and 1904 the fever cases fell to 214 and 90 respectively. It would seem, therefore, that by all methods of malaria prophylaxis—quinine taking, netting and drainage—malaria may be thwarted, and a combination of two or all of these methods affords proof that malaria is a preventible disease.

Malta Fever.

During the year 1905 no branch of medical scientific enquiry has borne better fruit than the investigation of the etiology of Malta fever by the Mediterranean Fever Commission. The Commission was formed in the early part of 1904, and in June of that year commenced regular investigations. The members of the Commission were Colonel Bruce, F.R.S., Major Horrocks, Staff-Surgeon Shaw, Dr. Zammit of Malta, and Dr. Johnstone of the Local Government Board.

The First Report by Major Horrocks was devoted to a study of the duration of life of the *Micrococcus melitensis* outside the human body. His conclusions were :—

(1) The *M. melitensis* is able to live for six days in a urine which has become alkaline from the presence of ammonia.

(2) The *M. melitensis* survives for sixteen days when spread in a thin layer on a glass cover-slip.

(3) The *M. melitensis* survives for sixty-nine days when planted in a dry sterilised manured soil.

(4) In dry sterilised sand the duration of life of the *M. melitensis* appears to be only twenty days.

(5) In a sterilised manured soil saturated with water the *M. melitensis* appears to survive for only seven days.

(6) The *M. melitensis* is able to live for eighty days on dry fabrics, such as blanket, khaki serge, and khaki cotton.

(7) The *M. melitensis* appears to live for a comparatively short time in sterilised tap-water. It was only recovered in pure culture six days after being planted out, though from the result of Experiment VIII. it appears possible that the duration of life may extend to three weeks.

Major Horrocks' Second Report consisted of "Further Studies on the Saprophytic Existence of *Micrococcus melitensis*," published September, 1904. His conclusions were :—

(1) The *M. melitensis* retains its vitality in sterilised tap-water for thirty-seven days.

(2) In a Maltese soil, allowed to dry naturally, the *M. melitensis* survives for forty-three days; and in one thoroughly dried immediately after inoculation it survives for twenty-one days.

(3) The *M. melitensis* survives for seventy-two days in a damp soil.

(4) Exposure to the sun for a few hours kills the *M. melitensis*.

(5) The *M. melitensis* survives for twenty-five days in sterilised sea-water.

The Third Report, on "The Recovery of the *Micrococcus melitensis* from the Urine, Fæces, and Sweat of Patients Suffering from Mediterranean Fever," is by Major Horrocks, in conjunction with Captain Kennedy. Up to September, 1904, the *M. melitensis* had been isolated thirty-nine times from the urine of thirteen different patients. The micrococcus was isolated not earlier than the fifteenth day in Malta fever and not later than the eighty-second day of the disease. The examination of fæces for recovery of the coccus proved negative, although as many as 1,026 plates were made from eighty-six stools. Major Horrocks remarks that many of the streptococci occurring in stools bear a superficial resemblance to the *M. melitensis*. From the sweat the *M. melitensis* had not been isolated at the time of the Report (September, 1904); the infection of bacteria-free sweat from Malta fever patients did not give the characteristic agglutinins in the blood of monkeys experimented upon; but in one experi-

ment by Staff-Surgeon Shaw, from the ordinary sweat (bacteria-bearing) of a Malta fever patient an agglutinative reaction was obtained. Experiments made to ascertain the presence of *M. melitensis* in the expired air of Malta fever patients, all proved negative; nor could monkeys be infected by the injection of broth infected by the expired air of Malta fever patients.

It has often been stated that Malta fever was caught from the polluted sea-water in the harbour of Malta, but experiment proved that the *M. melitensis* could not be detected in the sea-water of the harbour.

In the Fourth Report of the Mediterranean Commission, Major Horrocks gives details of "Experiments of the Mode of Conveyance of the *Micrococcus melitensis* to Healthy Animals." By experiments on monkeys it was shown that the inhalation or ingestion of infected dust will give rise to Malta fever in monkeys; and the ingestion of infected food (milk) proved positive, but whether the organism was absorbed by the stomach or by the mouth or throat was not determined.

The infection of healthy monkeys by contact with infected monkeys is probably through the urine excreted and not by bodily contact. The experiments made with the mosquito—*Stegomyia fasciata*—to test the possibility of the mosquito transmitting the disease proved negative in Major Horrocks's hands, although Dr. Zammit reported several cases that seemed to point to the possibility of the mosquito being the agent of transmission.

In Report Five, by Staff-Surgeon R. T. Gilmour, is given a "Description of a Method of Cultivating the *Micrococcus melitensis* from Small Quantities of Peripheral Blood and Inoculation Experiments with the Micro-organisms Isolated."

In quantities of so small amount as 1·0 cc. withdrawn from a vein of a Malta fever patient, and of this quantity 0·1 cc. in broth medium of which but 10 cc. was injected, a positive result was obtained.

Report Six, by Dr. T. Zammit, on "Isolation of the *Micrococcus melitensis* from the Blood," contains the technique to be observed in drawing blood from patients suffering from Malta fever, and the laboratory methods followed for cultivation.

Report Seven, by Staff-Surgeon E. A. Shaw, contains an "Interim Report of Experimental Work in the Investigation of Mediterranean Fever dealing with Blood, Skin, Sweat, Inoculations, Agglutinating Serum, and various Inoculations in Different Animals."

Shaw's conclusions are: (1) *M. melitensis* exists in the blood of patients in relatively very small amount, the smallest quantity of blood in which it has been found, $\frac{1}{256}$ cc., is practically the equivalent of 4 c.mm. This small amount of bacilli in the blood is interesting when the question of transmission of infection by mosquitoes is considered. (2) No definite relation can be established between any given stage of the disease and the presence of *M. melitensis* in the blood. (3) There is some indication of a diurnal variation in its presence in the blood. (4) No relation can be established between the agglutinating power of a patient's blood for *M. melitensis* and the amount of the latter present in the blood. (5) *M. melitensis* does not pass through Chamberland, F., nor Berkefeld filters, IV., V., or VI.

The most important practical point determined by the Commission was the discovery by Dr. Zammit, in June, 1905, that the goats in Malta are infected by the *M. melitensis*, that the coccus can be isolated from the milk of infected goats, and that the urine of these animals contains the specific organism. As the milk supply in Malta is chiefly derived from the goat, it is readily understood how important this discovery is. The udders of the goats are usually very large, actually touching the ground, and it is plain that the udder may become contaminated by the urine-polluted soil, so that both by mechanical means and by the secretion of milk itself the milk supply may be contaminated.

The whole constitutes a fine piece of scientific work, and the members of the Commission are to be congratulated on their work, which promises to be eminently successful in staying the ravages of this scourge in Malta. The reports received from time to time that Malta fever has been met with in places other than Malta, and perhaps Gibraltar, have to be received with some hesitation, for except perhaps the reports from Orange River Colony, in but few cases have we any authority for pronouncing the disease to be Malta fever, except from clinical evidence alone.

Beri-beri.

Next in importance to the work accomplished in Malta fever during 1905 is perhaps that of Dr. Hamilton Wright in connection with beri-beri. Dr. Wright may not have completely proved his point, but his conclusions have been arrived at after prolonged and careful study and investigation, and if he has done no more than to direct our attention into other channels of study in elucidating this mysterious disease he has contributed towards widening the field

of investigation. But Dr. Wright would seem to have done more than that, for he has by clinical and pathological demonstrations succeeded in presenting to us beri-beri in a new aspect and on a convincingly clear scientific basis. Dr. Wright's observations and conclusions are summarised as follows:—

That beri-beri is an acute or subacute infectious disease of short incubation period. That it is due to a specific micro-organism not yet isolated. That this specific organism is not one whose special habitat is a particular food, such as rice or fish, but one that may, nevertheless, be ingested with any food or drink accidentally contaminated. That this organism, having gained entrance to the alimentary canal, multiplies in the contents and mucosa of the stomach and small gut, but chiefly in the contents and mucosa of the pylorus and duodenum. That it there elaborates an extracellular toxin, which, being immediately absorbed, poisons the peripheral terminations of, first, the vagi to the stomach and heart, and then other efferent, afferent, and autonomic neurones to different extents and degrees, thus giving rise to groups of symptoms which may be broadly classified as acute pernicious beri-beri, acute, and subacute beri-beri. That these cases run a definite course of about five or six weeks, and on the elimination of the causal organism and its toxin the poisoned neurones recover and the patient becomes whole again, or that the poisoned neurones only partially recover, and there develops in those of them which do not a true degeneration which migrates centralwards. For this persistent atrophy, and the various paralyses, atrophic disturbances, and œdema which result, Wright has proposed the term "beri-beric residual paralysis."

This view of the clinical history of beri-beri points to a gastro-duodenitis as the primary local lesion in the complaint, and is supported by actual clinical observations of patients. The paralysis is a late development or even a sequela of the disease: as in diphtheria paralysis supervenes after the acute signs and symptoms have subsided, as in plague the bubo is subsequent to gastro-intestinal lesions, so in beri-beri we find an alimentary preceding the neural and other evidences of the disease.

The etiology of the gastro-duodenitis has not yet been worked out, but Dr. Wright suggests a bacillary origin, and that it is by way of the fæces that the infecting organism or material escapes from the body. Acting on this grounded belief he applied it to the treatment of the disease in a gaol at Kuala Lumpor, and was successful in practically eradicating the disease from amongst the prisoners in the gaol, which for many years had been subjected to virulent and persistent outbreaks of beri-beri.

Plague.

There is little to record concerning plague, except that it continues to prevail in the several haunts we have associated with the disease for several years. The persistency of plague when once it has established itself in a town or district is characteristic of the disease, as it has been known from early times. This fact alone, in addition to the actual mortality it entails, is sufficient to explain the dread of its appearance and the extraordinary precautions taken to prevent its inroads.

India remains the chief centre of the disease in the world at present, and except in China, no other country could have withstood the mortality which prevails there and continued to play its part in the economy of nations.

During the first six months of 1905 no fewer than 878,602 persons died of plague in India. This is the largest mortality for any period of six months yet recorded, for it is 151,971 in excess of the corresponding period of 1904, which up to 1905 presented the highest death-rate since plague appeared in India.

During the months August to November, 1905, the mortality from plague has been much reduced in India, so that possibly the death-rate for the year may be under one million, and if that proves to be true the total for 1905 will be under that of 1904, when the deaths from the disease numbered 1,034,787.

The diminution may actually prove that the virulence of the disease is abating, or it may only be a wave of subsidence with which we are familiar in the history of the disease.

Inoculation is making considerable, if not wholly satisfactory, headway in India, but more is being done in this direction than is generally known. Certain it is that inoculation affords marked protection against plague, and also considerably diminishes the case mortality of those attacked.

Haffkine's method of inoculation is the one at present followed, and there seems every reason to consider it the best. The report of Major E. Wilkinson, I.M.S., founded on work done during 1902-03 is satisfactory evidence of protection. In a community of 827,427 persons 639,630 were not inoculated, 187,797 were inoculated; of the former 29,723 died of plague, whilst

among the latter there were only 814 deaths from the disease. Had the 187,797 not been inoculated the presumed number of deaths would have been 8,680, in place of the 814 which actually did occur. But by the inoculation it would appear that some 7,866 lives, or stated in percentages 90·62 per cent., were saved by the inoculation.

A report from Aden by Mr. E. S. Winter also confirms the efficacy of inoculation, and from several parts of India we have similar accounts. Stated broadly, it appears that inoculation affords well-nigh an eightfold degree of immunity ; and when plague has developed amongst an inoculated community, less than half the number of deaths occur than amongst those not inoculated.

We are indebted to W. J. Simpson, Hunter and Bell, in Hong Kong, for a more clear clinical history of plague than any yet advanced. These observers showed that plague was in most instances a disease set up by infection by way of the alimentary canal, and that the bubo is a rather late development in the illness. Gastric and intestinal lesions precede the lymphatic gland enlargements. They at the same time admit the possibility of a direct pneumonic infection. This view of plague was a great stimulus to further investigation and afforded a key to prophylaxis.

The vexed question of the relation of plague in rats to plague in man is not yet settled. There can be no doubt that men and rats suffer in common from the disease, but whether they are both infected by some common agent or whether they stand to each other as cause and effect is not determined. The suggestion that the black and brown rats play different parts in the disease was first mentioned by Cantlie in 1897, and the idea has been elaborated since then. The black rat —the *Mus rattus*—is more a household pest than is the *Mus decumanus*, or brown (Norwegian) rat, which lives chiefly in drains and outhouses ; and it is considered possible that the geographical distribution of these rats aids in determining the geographical distribution of plague in man.

Yellow Fever.

Around the Gulf of Mexico yellow fever prevailed during July, August, and September of 1905, and even in October and during November cases of the disease were reported. New Orleans seemed to be the chief centre of the outbreak. Cases were first notified in New Orleans in July and up to the end of the second week in November, when the disease seemed to have well-nigh wholly subsided, some 3,400 persons were attacked by yellow fever. The deaths from the disease numbered 451, a mortality rate of 13·20 per cent. only. The only other town on the northern littoral of the Gulf of Mexico where yellow fever seemed rife was at Pensacola, a town situated in Florida, close to the Alabama frontier, and only a short distance by sea from New Orleans. In Pensacola 560 cases and 80 deaths were reported, again furnishing a remarkably low death-rate, some 14·28 per cent. only. It is a curious turning of the tables that Havana, the home of yellow fever in Cuba for some 150 years, and the centre from which the disease formerly spread to the Gulf of Mexico ports, should during the recent outbreak have been taking rigid quarantine steps against infection from New Orleans and other ports. Since the determined suppression of yellow fever in Havana some two or three years ago the city has been practically free from the disease, and the few cases that occurred during 1905 were described as imported cases merely.

Yellow fever was stamped out in Havana by the practical application of the belief that the *Stegomyia fasciata* mosquito is the means by which the disease is transmitted. This plan of yellow fever prophylaxis was practised also in New Orleans and elsewhere, but not until the disease had got a fairly firm hold upon the communities.

The treatment of the disease has not advanced beyond treatment by "general principles." An initial purge, a vapour bath, a mustard bath to the feet, stimulants, alcohol, strychnine and caffeine when indicated, diuretics and hot wet packs for suppression of urine, constitute the sum and substance of yellow fever treatment at present.

Tick Fever.

Excellent work in the elucidation of tick fever has been done by J. L. Todd, by the late T. Everett Dutton, and by Drs. Ross and Milne in the Congo Free State. A spirochæte has been demonstrated to be the specific agent in the causation of human tick fever. The *Ornithodorus moubata* (Murray) is the tick by which the spirochæte is transmitted from animal to animal, and monkeys also have been infected experimentally by allowing ticks to bite them.

Human tick disease was described by Livingstone. He first noticed the disease in Portuguese South Africa, and he also mentions being annoyed by the tick whilst

staying at Nyangwé in 1871. The natives in the tick-infected districts have always declared that the bite of the animal caused illness, but it was not until 1904 that their contention was absolutely proved by scientific investigation.

The Course of the Disease.

Incubation Period.—One week.

Invasion, Signs, and Symptoms.—The onset is sudden, but a distinct rigor has not been noted. The patient is suddenly prostrated and complains of head-ache, bone-ache, and back-ache. Vomiting generally obtains at the commencement of illness. Diarrhœa is fairly constant, but constipation may occur. There are usually three or four attacks of fever, each attack lasts from three to four days, with marked relapses extending from a period of five to as many as nineteen days. The temperature during the feverish attacks may rise towards the evening to as high as 104° F. or to over 105° F. The attacks usually end in a marked perspiration. The most notable feature of the disease is the extreme prostration which prevails during the febrile attack and the sudden recovery of spirits and the feeling of fitness as soon as the temperature falls to normal. The spleen is sometimes enlarged. Herpes, epistaxis and hiccough have been recorded during the attacks.

The spirochætæ, when numerous, can be readily seen in fresh preparations of blood as rapidly moving spiral threads. When the parasites are scanty in number the best method of demonstrating their presence is by dehæmoglobinising a thick blood film and staining by some modification of Romanowsky's method, or a weak solution of carbol-fuchsin.

The distribution of the human tick in the Congo Free State is interesting. Livingstone says before the Arabs came to the country bugs were unknown, and that wherever the Arab traders went the bugs were met with. This holds good at the present day, for tick fever is confined to the commercial highways; these are the old caravan routes and the rivers. It is probable, however, that ticks reached the Congo Free State from the east, carried by the Arabs, and from the Portuguese territory to the south.

The conclusions arrived at by Drs. Dutton and Todd are:—

(1) Tick fever is clinically identical with relapsing fever, and has for pathogenic agent a spirochæte.

(2) The spirochæte is probably *Spirochæte obermeieri.*

(3) The tick *Ornithodoros moubata* can transmit the spirochæte from animal to animal.

(4) The transmission is not merely mechanical, but some developmental process is carried on in the tick.

(5) A considerable degree of immunity or tolerance to the spirochæte can probably be acquired.

J. C.

LIVINGSTONE COLLEGE.

The annual report of Livingstone College for the year 1905 is one which must serve to encourage all those engaged in furthering the admirable work which is being so ably conducted there. By the acquisition of a neighbouring plot of land, through the generosity of Mr. Robert Barclay, the College has been freed of the possibility of being overlooked by cheap dwellings, which were contemplated being built close by. The medical education given by the Principal, Dr. C. F. Harford, and other members of the staff has proved of pronounced benefit to missionaries proceeding to up-country districts in tropical countries. The marvel is that the number of students at the College have been so few; for one cannot conceive missionary societies sending men or women to outlying parts of the world, where no medical men are available for advice, without their having previously availed themselves of the opportunities afforded by the Livingstone College, whereby not only the health of the missionaries themselves may be better maintained, but also the physical welfare of the natives who come to them for spiritual instruction.

That the College is fulfilling its functions in a circumspect manner cannot be better gathered than from the statement made by Dr. Donald MacAlister, President of the General Medical Council, at the lecture on "Risks to Health in the Tropics, their Relation to Imperial Expansion and Missionary Enterprise," given at Cambridge on November 22nd, 1905, by Dr. C. F. Harford. Dr. MacAlister said:—

"If you like to quote me you may do so as saying that I have watched with interest, and perhaps some solicitude, the development of Livingstone College. I had doubts lest its initial purpose of giving to missionaries about to settle in tropical countries such lessons in the elements of hygiene and of medical and surgical first aid should be diverted to that of enabling imperfectly trained or unqualified men to pose as doctors in foreign parts. If that doubt had been confirmed, I, as official guardian of the Medical Register, would not be there that night; but I had satisfied myself that this was neither the purpose nor the effect of the training afforded at Livingstone College. I was sure that so long as a medical man so excellently qualified by experience, knowledge and prudence as Dr. Harford was responsible for the instruction given and the policy pursued, nothing but good could result to missionaries and their flocks from the fact that they had passed through the College."

We propose to deal more fully with the report in our next issue.

To the Editors of the "Journal of Tropical Medicine."

Sirs,—I enclose an illustration of an instrument invented by myself, though not patented, for the examination of the throat by day or by night.

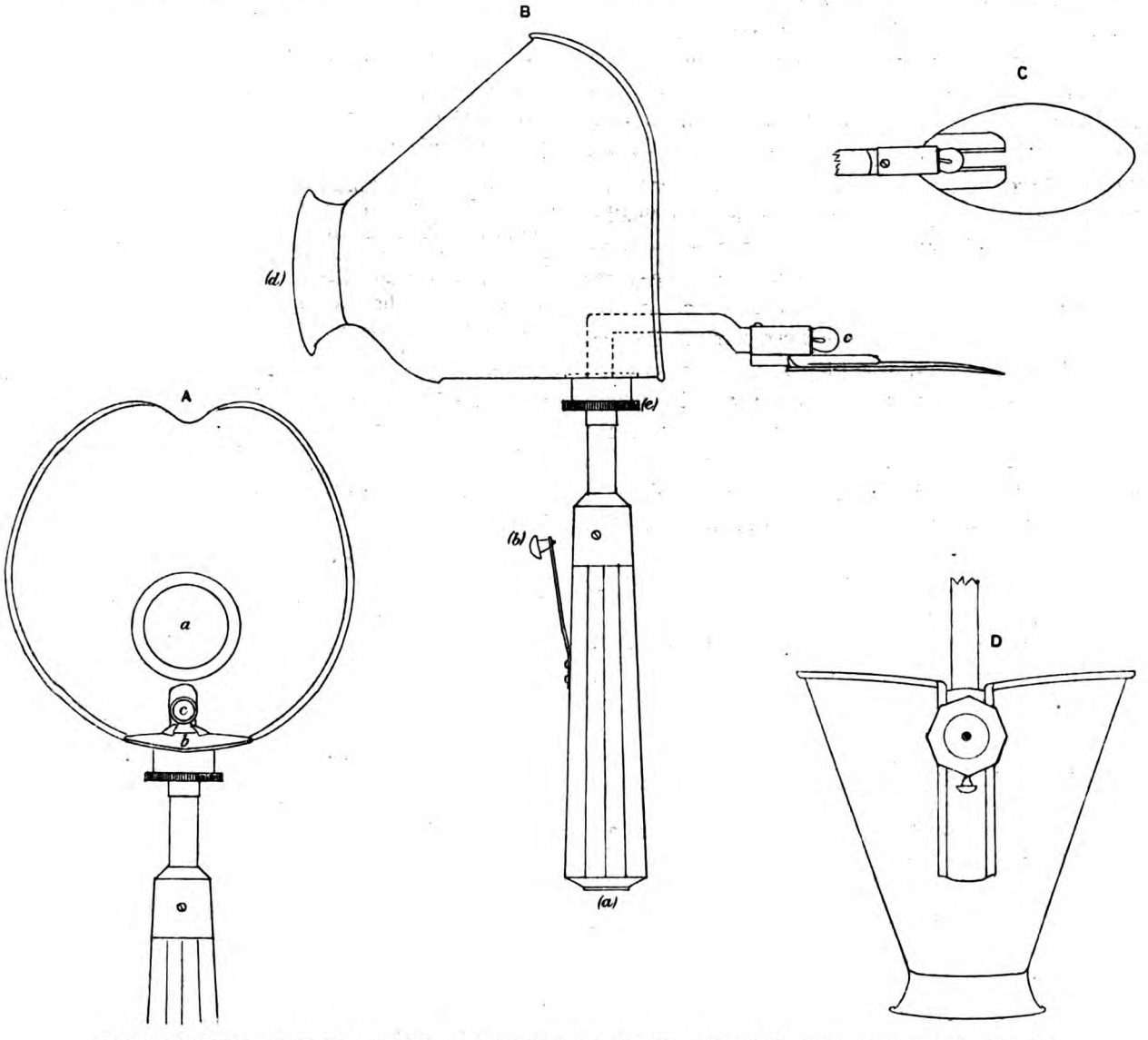
A gives the front view of the instrument, showing at (*a*) an opening of a circular form, fitted with a piece of plain glass, through which the fauces and palate, the mouth, pharynx, and upper part of the œsophagus, as well as the epiglottis and larynx with vocal cords, may be clearly seen by day or by night. In the latter case an electric lamp at (*c*) illuminates these parts, while (*b*) depresses the tongue and so gives the surgeon a good view of the parts behind and below the root of the tongue. It protects the surgeon or physician while examining cases of infectious throats.

B gives a side view of the instrument.

C the tongue depressor detached, and can be lengthened or shortened.

D the face-piece also detached.

At *B* the detached parts, *C* and *D*, are to be seen connected and ready for use. At this point (*a*) is attached the wires of the battery which pass through an opening at the bottom of the stem when required for use; at (*b*) you press the button on to the stem and in contact with the latter a powerful little electric light is emitted at (*c*); while through the glass opening at (*d*) you view the parts of the patient's mouth, throat, and windpipe. The face-piece can be either fixed firmly at the point (*e*) by the revolving disc, or it can be moved freely to any direction you desire to fix your examination upon. If you desire to obtain a clear view of the larynx and vocal cords you depress the stem, which also causes the tongue to be depressed by the tongue depressor, *C*. To obtain a magnified view of the parts you can attach either a magnifying glass at (*d*), or the binocular glasses properly focussed.



Invented by Major G. H. Fink, I.M.S., M.R.C.S.(Eng.), L.S.A.(Lond.), and the instrument made for him by Messrs. Down Bros., London.

Yours, &c.,

G. H. Fink.

Notes and News.

THE Director of the Wellcome Physiological Research Laboratories desires to notify the medical profession that in consequence of the increasing demands upon the space available at these Laboratories in connection with physiological and bacteriological research and the production of therapeutic serums, *clinical diagnosis work in this Institution will be discontinued on and after December 11th*, 1905.

The clinical diagnosis work will be transferred to—Dr. E. C. Bousfield, The Camberwell Research Laboratory, 363, Old Kent Road, London, S.E.

MEDICAL CONGRESS AT LISBON, 1906.

Thursday, April 19, to Thursday, April 26.

THE Orient-Pacific Line beg to notify that they propose sending their fine twin-screw s.s. *Ophir*, 6,814 tons register, 10,000 horse-power, to Lisbon, for this Congress.

The fare for the seventeen days' cruise (exclusive of shore excursions) will be from £15 15s. upwards, according to the position of cabin occupied.

Plan of the steamer and further particulars will be sent on application.

Managers: F. Green and Co., Anderson, Anderson and Co. Head Office: Fenchurch Avenue, London. For passage apply to the latter firm at 5, Fenchurch Avenue, E.C., or to West End branch office, 28, Cockspur Street, S.W.

PROGRAMME OF CRUISE BY THE "OPHIR."

Thursday, April 12th, 2 p.m., leave Tilbury.

Friday morning, call at Cherbourg to embark Continental passengers.

Sunday, 15th, at Vigo.

Tuesday, 17th, at Tangier and Gibraltar.

The principal places of interest ashore will be visited.

Wednesday, 18th, 6 p.m., arrive Lisbon. During the stay of six days at Lisbon various excursions will be made, including visits to Madrid, Toledo, and the Escurial.

Tuesday, 24th, 6 p.m., leave Lisbon. Passengers who wish can leave at 4 p.m. next day, Wednesday, and rejoin the *Ophir* by train at Leixoes.

Wednesday, 25th, at Leixoes (for Oporto). The day will be spent ashore visiting the principal sights.

Saturday, 28th, call at Cherbourg to land Continental passengers.

Sunday, April 29th, 8 a.m., arrive back at Tilbury.

Plague.

India.—During the weeks ended November 25th, and December 2nd, the deaths from plague numbered 2,836 and 2,890.

South Africa.—No case of plague during the weeks ended November 25th and December 2nd and 9th in Cape Colony.

Mauritius.—During weeks ended December 14th, 21st, and 28th, fresh cases of plague numbered 8, 5, and 2; deaths from the disease, 7, 3, and 2.

Hong Kong.—During the week ended December 23rd, fresh cases, 3; deaths from the disease, 3.

New Drugs.

THE pharmaceutical preparations of Messrs. P. Beiersdorf & Co., of Hamburg, have long been renowned for their purity and excellence. The readers of the JOURNAL OF TROPICAL MEDICINE will be interested to learn that this firm achieved great distinction at the "Exposition Universelle," held at Liège in 1905, they having gained the highest possible award, the Grand Prix, for their pharmaceutical specialities.

We congratulate Messrs. P. Beiersdorf & Co. on this signal triumph, which is the more significant, inasmuch as their products were the *only* ones of German manufacture to gain the highest award, the Grand Prix, at the Liège Exhibition.

"ERNUTIN." A new product presenting the active therapeutic principle of Ergot.

"Ernutin" is issued in hermetically sealed phials, and being sterile is eminently suitable for hypodermic or intramuscular injection. When it is desired to obtain an immediate effect, as in *post-partum* hæmorrhage, intramuscular injection is to be preferred.

As "Ernutin" is a very potent preparation, its administration must be carefully guarded, and the dosage regulated accordingly. It is suggested that the initial dose be five minims, and that any subsequent dose required should depend upon the ascertained reaction of the patient.

BURROUGHS WELLCOME AND CO.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"New York Med. Journ.," September 23, 1905.

MALARIA. LECTURES ON THE DISEASES OF THE BLOOD. By JOHN M. SWAN, M.D.

"Riforma Medica," August 5, 1905.

SIGNORELLI, A. DISTURBANCES OF CUTANEOUS SENSIBILITY OF TUMOURS OF THE SPLEEN AND IN SPLENOPATHIES IN GENERAL. THE SPLENIC AREA.

Signorelli states that (*a*) "the splenic area" for clinical purposes is in the fifth intercostal space along the mammary line; (*b*) the "posterior splenic area" corresponds to the fifth, sixth, seventh, and eighth spinous process of the dorsal region; (*c*) "the lateral splenic area" exists in the intercostal spaces in the left mid-axillary line. These regions become sensitive in splenic derangements due to tumours or enlargement of the spleen. Corresponding areas of sensitiveness may occur on the right side by diffusion in exactly corresponding points to those described on the left side.

Original Communications.

FIT AND UNFIT PERSONS FOR RESIDENCE IN WARM CLIMATES.

By W. Hartigan, M.D., D.P.H.

It has occurred to me that a few notes, embodying the results of experience gained during many years' residence in the Far East, might be interesting and useful to those who, by necessity or inclination, are induced to make their homes and seek employment in tropical and sub tropical regions. This must be my excuse for the following article, which makes no pretence to be a learned disquisition on climatology, but is simply a series of practical hints from a practising physician.

Whilst living in China I had often noticed how many more or less delicate men had been advised "to go out East, as they would be sure to improve," and now, when examining in London for various Far Eastern firms, I have frequently to reject applicants as "unfit" who had likewise been told that "they ought not to remain in England, but would get on capitally in China, or Burmah, or Peru, as the case might be." Such advice has usually not been given by those who have had tropical experience, or made a a special study of epidemiology, but by the generally well-informed, thoroughly practical family doctor, in whose ken any distant clime, with a bright sun and tropical foliage, where an open-air life can be enjoyed, is just the place for the boy whose "lungs are slightly touched," or whose delicate physique unfits him for the rough-and-tumble of the football field, or who cannot bear the hardships of school life. This fallacy frequently gives rise to disappointment, and occasionally leads to disaster. It is true that exceptionally fine physique, great muscular development, or exuberant energy, are not necessary for healthy life in the Tropics. In my experience, wiry men, of medium height and slight build, even though a little under weight, of an active disposition, but not nervous temperament, do quite as well when transplanted to the East as the herculean gladiator of the playing fields or the madly enthusiastic gymnast. These latter (certainly when engaged in office work) seem to give way more to tropical *ennui*, become lazy, go in for verandah-life in a long chair, plus a whisky-and-soda, lose their energy, give up games and exercise, and soon "run to blubber." The nerve tone of the big man seems to be pitched in a lower key than that of his weaker brother, as if Nature would not pour out all her gifts on one subject, and balances the want of showy, physical attributes, by the gift of greater physiological resisting power against enervating climatic influences.

The great tropical explorers—Livingstone, Stanley, Emin, Johnston—men of superabundant grit and energy, were none of them giants, whilst it is an open secret that Lords Wolseley and Roberts, who have faced death and disease in every clime, would not "come up" to the present physical standard of an Army medical board. Careful discrimination must, however, be exercised. The weedy, narrow-chested, undersized, anæmic applicant, with thin, sandy or fair hair, pale pinched features, too clear or high-coloured complexion; and likewise the gawky, undeveloped, lanky skeleton, with straight, lustreless, dark hair, probably bright eyes, but sallow, jaundiced features; or again the physically well-built, middle-sized man, uncertain and slow of speech, with a dull heavy expression, and face of unhealthy colourless hue, phlegmatic, except when he enlarges on the state of his own health; are all equally unsuited for the Tropics. The former become early victims of tropical anæmia, with its consequences, loss of energy and inability to work, and readily succumb to prevalent intestinal diseases; whilst the latter develop into chronic dyspeptics, with a morbid tendency to introspection and dislike of companionship, which too frequently leads to secret tippling.

Another type to be avoided is the over-strung, exuberantly active, good-all-round, "admirable Crichton," who burns the candle at both ends, dragging through his long office hours with good grace enough, doing his work fairly well—for he has brains—but perhaps not very thoroughly, spending his evenings in theatricals or dancing, enjoying his little dinners and suppers, taking or giving "a peg" or liqueur at every opportunity; he has exhausted his reserves, and whilst he may get along happily enough in a temperate climate, will, should he go to the Tropics, almost inevitably become "jumpy" and hysterical, subsequently physically weaker, with progressive loss of weight, followed by loss of interest (if it ever existed) in work, incapability of concentrated application, degenerating into a childish state of "don't care"; in short, he has generally "gone to pieces" without any very definite reasons therefor. This condition is usually combated by frequent "nips," forenoon "cock-tails," and early morning "night-caps," eventually culminating in that well-known euphemism, "tropical neurasthemia," or "climatic dyspeptic gastritis," more correctly known as "chronic alcoholism," vulgarly "drink"; finally eventuating in "a passage home," with a polite intimation of "services being no longer required."

A tropical climate does undoubtedly "get on the nerves," but it is usually ably assisted by "Scotch," "Irish," or "Cognac," good, bad, and indifferent; nevertheless, the man of nervous temperament is not a good subject for the Tropics, whilst the victim of any of the neuroses is generally unfit for work or residence in hot climates. Asthma may probably be excluded from this generalisation, as supposing the asthmatic to have the power of selection, he may find a suitable place wherein he will enjoy almost complete immunity, but in the absence of such choice the Tropics and Sub-Tropics should be avoided. This prohibition applies also to the epileptic, even if only suffering from "petit mal."

Likewise the man of bibulous habits is most unsuitable; his thirst is certain to be aggravated, whilst the amount of liquor consumed with comparative impunity in Britain becomes a potent nerve-poison in the Tropics. He who has once been the victim of alcoholism, even if apparently cured, should never return to the East, the old temptation will grow with opportunity, an increased inclination will overcome an enfeebled resistance, "and the dog is returned to his own vomit again."

The slave of the pipe too, with blackened, carious teeth, irregular heart's action, short of wind; and the cigarette fiend, whose congested throat, dried, furred tongue and watery eye proclaim the chronic dyspeptic, will not improve in a land where cigars can be had for a few cents, and smoking is permitted and encouraged everywhere and anywhere. In moderation the fragrant weed is soothing and harmless, but when a pocketful of cigars can be smoked between early breakfast and tiffin, and the chimney is then kept going till bedtime, the result is a shaky, nervous individual, frightened at his own shadow, seeing fatal illness in every trifling ailment, imagining those he has not got, incapable of exertion, or breaking into profuse perspiration on making the most ordinary effort, unable to make up his mind on any subject, droning into unsympathetic ears his personal or business worries, who finally "goes smash," financially and morally, or goes home. This is not a fancy picture. I have seen it; *ergo* "*cave canem*." For such, "better fifty years of Europe than a cycle of Cathay."

To return to the point whence I started, in my experience the man whose lungs—to use the popular expression—are merely weak, has generally on his first arrival in the more healthy Tropics improved, particularly if he has previously enjoyed fairly good health; but should he unfortunately be attacked by malaria, dysentery, sprue, or other debilitating disease, which, however, he is not especially liable, the weak spot is sure to be found out and pulmonary disease follow.

If, however, there exists latent pulmonary disease, by which I mean a previous lesion at the moment quiescent, the damp tropical heat and super-saturated air, even in the absence of other illness, will almost inevitably cause a recrudescence of active disease in the impaired lung, which will rapidly break down under continued exposure to its unhealthy and debilitating surroundings; whilst, if foci of active disease are already present, evidenced by a general infection or enlarging cavities, the subsequent course is most rapid, either the cavities pour forth pints of stinking pus swarming with bacteria, or, the lungs rapidly solidifying, breathing becomes most laboured, expectoration, which may not be at all profuse, is full of tubercle bacilli, then high temperatures and exhausting perspirations, frequently followed by severe and repeated hæmorrhages, ensue; these rapidly wear out the patient, and death ends the scene in a few weeks.

We have all seen the girl, previously in apparently good health, with perhaps too high a colour, who, you are, told "has caught cold." You take a grave view of the case, but are not believed. In a few days her downward progress puts a melancholy end to the scepticism and incredulity of family and friends.

Or perhaps the athletic young man, often a Scandinavian or Dane, who knows he has had some slight lung trouble, tells you he has spat up a little blood which he thinks has come from the throat, and brings some blood-tinged, scarcely viscid sputum, in which tubercle bacilli abound. You recommend prompt departure for healthier climes; he does not or cannot take your advice; rapidly recurring hæmorrhages follow. He at last gets away, the hæmoptysis is checked, but irreparable mischief has been done, and he, too, succumbs, a victim of the too exuberant growth of the tropical forcing-house and of the mistaken advice which preferred "the nice warm climate" to his native northern snows. Sensible precaution can minimise the ill-effects of cold, which in many ways is most beneficial, but the deleterious qualities of damp heat are impossible to eliminate.

Although in my opinion *continued* residence in most parts of the Europeanised Far East is very detrimental to those phthisically inclined, the conditions obtaining in Hong Kong, Amoy, &c., during winter, and in Shanghai and Northern ports in spring and early autumn, may be actually favourable to them, whilst Chefoo and Wei-hai-wei are, even in summer, fairly good. Pekin, Tientsin, &c., being drier, are less objectionable (as all-the-year-round residences) than the South China stations, but the dust is a great disadvantage.

Japan, likewise, though better than South China or the Straits, cannot be recommended. Its climate is variable and damp; even the hill resorts, though ideal at certain seasons, are injurious for other and longer periods.

Manila, called in some geography books "a sanitarium," is also unsuitable. Damp and great dry heat alternate, the climate is most relaxing, intestinal complaints are prevalent, cholera epidemics far too frequent. Singapore, Penang, the Malay States, Burmah, Java, Seychelles, Mauritius, &c., are all objectionable, though some have hill resorts where the conditions are decidedly more favourable, but one must always remember that the man who is earning his living can very rarely take advantage of them, whilst the man of means will go to Egypt, or Davos, or California, where good air, comfort, and life-giving amusements all contribute to renewed health and vitality. I have purposely excluded the Riviera, having found its climate lowering, treacherous, and changeable, many of its popular resorts insanitary (in flies and smells they could favourably compete with "Eastern bazaars," or "China towns"), whilst, when the mistral blows, the dust is most irritating to delicate throats and bronchi: the sun and sky give them their only advantage over our cloudy land.

The man whose first object is "to get a living," and who can only afterwards indulge in the endeavour to keep alive, should seek an open-air life in Colorado, Arizona, or parts of South Africa, Australia, or New Zealand, &c. If he must dwell in cities, Sydney, San Francisco, Cape Town, &c., will afford him fair opportunities with comparative safety, but let him keep away from Eastern towns. With care, he would have as good chances of prolonged life at home.

In conclusion, I would say that the healthy, steady man, of slight physique, active habits and cheerful disposition, not necessarily a teetotaller, but temperate in all things, who recognises his duty to work as well as the necessity of play, need have no hesitation, should the glamour of the East allure him, in seeking "fortunes, buffets, and rewards," "at the quiet limit of the world," or in following a vocation which called him to labour in tropical vineyards. Of such it may not be said that "the eyes of a fool are in the ends of the earth," always remembering *in medio tutissimus ibis*.

THE QUESTION OF THE MODE OF INFECTION IN MALTA FEVER.

By Edward H. Ross, M.R.C.S., L.R.C.P.

Medical Officer, Sanitary Department, Port Said, Egypt.

Malta fever has been the subject of some considerable attention during the past few years on account of its ravages amongst the *personnel* of the British Army and Navy stationed in the island of Malta. Malta is the headquarters of the Mediterranean Fleet and possesses a large military and naval garrison with a total numerical strength of nearly 30,000 men. Amongst these Malta fever has had a fairly constant annual incidence of nearly 700. Owing to the prolonged nature of the disease a majority of the cases have had to be invalided home to England, and thus their services have been temporarily lost to the Empire. This disease, therefore, has been the cause of the expenditure of much of the public money and a notable reduction in the efficiency of our available fighting forces in the Mediterranean. In addition to this the people of Malta suffer greatly from Malta fever, which gives the island a bad name, keeping away visitors, and interfering with its commerce.

Malta, however, is not the only place where the disease is prevalent, for its existence has now been demonstrated in several of the seaports of the Mediterranean, the Philippine Islands, Hong Kong, &c. The name Malta fever, therefore, is hardly fair to Malta, nor that of Mediterranean fever to the Mediterranean; but the disease is now so well known by these names that a new one would be inconvenient and confusing.

Malta fever, then, may be defined as a prolonged fever which may be either continuous, remittent or even intermittent in type, usually exhibiting waves, undulations, or cycles of severity, and accompanied almost invariably by enlargement of the spleen, profuse sweating, and certain complications. It is caused by the *Micrococcus melitensis* of Bruce, which is found in the blood and blood-forming organs of men and animals suffering from the disease.

The waves of fever continue in the majority of cases for two or three months, but the disease occasionally aborts in two or three weeks, or it may continue for more than a year with apyrexial intervals. The mortality is low; in most years it is less than 3 per cent. The diagnosis of Malta fever does not, as a rule, present much difficulty; the prolonged nature of the fever, the accompanying sweating, the complications of synovitis, neuritis, and the persistent anæmia, in addition to the fact that the disease is only endemic in certain sub-tropical towns, renders the clinical diagnosis an easy matter. In a person living in Malta, or who has recently resided in Malta, who has fever which continues for two or three months, who complains of little but malaise, headache, pains in the limbs and joints, and who exhibits no physical signs save those of fever and enlargement of the spleen, and who has never shown the ordinary signs of typhoid, the disease is almost certain to be Malta fever. But in addition to the clinical aspect of the case the knowledge that the *Micrococcus melitensis* will agglutinate in the presence of immune serum is of great service. This serum reaction is fairly constant in its results and is of the greatest value as a confirmatory test in diagnosis. But it is not without its fallacies, for one occasionally finds variations in the agglutinating capabilities of apparently identical strains of the micrococcus, and thus confusing results are sometimes obtained.

The most conclusive means of diagnosis lies in the separation of the micrococcus from the blood of the patient; but this is not always practicable, and the fact that it could not always be carried out has diminished the value of much of the experimental work done. When obtained from the blood or elsewhere the identity of the micrococcus may be tested by its agglutination with immune blood serum, innoculation into susceptible animals and its subsequent recovery from them, its reaction to litmus, and negative Gram staining. Unfortunately it has not been in the power of many of us who have been investigating this disease to carry out all these confirmatory tests, so that the results of our experiments cannot be regarded as conclusive as might have been wished. But as a rule, save in exceptional cases, the diagnosis is easy and the work done must be valued accordingly.

There is no known specific cure for Malta fever, and up to the present time, according to the literature, not very much work has been done to obtain an antitoxin or a prophylactic serum for it; therefore it is necessary to find out how the disease is conveyed from one person to another in order to be able to take measures for its prevention. Having this object in view, Surgeon G. M. Levick, R.N., and myself undertook to investigate the disease by observation and experiment. After observing many cases of the disease from an epidemiological standpoint, we noted the following factors, and on these factors or postulates we based our experiments.

Postulate 1.—Malta fever is only prevalent in the towns near the coast of sub-tropical seas.

The only exception to this rule that we have, up to the present time, any reason to consider is the occurrence of Malta fever in Cairo. In this place the disease is said to exist, but beyond the statement to that effect we have but little proof of it at present. Judging by the only obtainable statistical returns, namely, those of the Army Medical Service, one finds that in the report for 1898, 191 cases of Malta fever occurred in the British garrison in Cairo; while in the reports for 1901 and 1902, when better methods of diagnosis had been instituted, and the disease better differentiated, the number of cases which occurred in in the garrison fell to 7 and 4 for the two years respectively; so that in the space of four years, and with the same numerical strength of troops—namely, 5,000, the incidence of the disease had diminished from 191 to 4; while in the contiguous ports of Port Said and Alexandria the disease had increased. The inference is that the existence of endemic Malta fever in Cairo is at present non-proven.

With this exception, then, so far as we have been able to find out, Malta fever is confined to seaport towns in the Mediterranean, in the Philippine Islands, Hong Kong, Cuba, and Bermuda, its existence in the last two places, as in India, being still doubtful.

So far as the Mediterranean is concerned the distribution is peculiar, for it is confined to the southern and eastern shores. Having visited many of its ports during the past eighteen months, we have enquired into the prevalence of the disease in each, with the following results: In some places cases of prolonged fever were examined by us clinically, and tested with the serum reaction, and were found to be cases of true Mediterranean fever—Corfu, Beyrut, Port Said, Malta. At the following places the disease has been identified by the local medical men, and tested by them with the serum reaction, and found to be prevalent: Tunis, Algiers, Athens, Alexandria. At the following places prolonged fevers are endemic, but we have been unable to find out if they have been definitely proved to be Malta fever or not: Smyrna, Constantinople, the Island of Lemnos, Oran. At Gibraltar, Malta fever was very prevalent two years ago, but from all accounts the disease has now almost disappeared, although at Algeciras it is still believed to exist.

On the northern shore of the Mediterranean the disease, if it exists at all, is very slightly prevalent; but we have not been able to obtain much information. At Toulon, and on the Riviera, it is absent (Shaw); at Barcelona it is probably malaria; at Genoa it is absent; but we have been informed that Neapolitan and Sicilian fever is true Mediterranean. With the exception of the case of Cairo above mentioned, our enquiries have led us to believe that the disease does not spread inland. It does not exist at Ismailia (Pressat), nor at Suez (Creswell), whilst at Port Said and Alexandria it is very prevalent; also three years ago the disease was present in Gibraltar, and is now at Algeciras, but not in the neighbouring Rhondda Valley, and while prevalent in Naples it is absent from Rome; so that we concluded that the disease is in some way connected with the sea, and this has consequently influenced our work.

Postulate 2.—Malta fever exists in endemic places all the year round, but its incidence is enormously increased in the hot weather, namely, from April until November, during the Mediterranean dry season.

Postulate 3.—In Malta the disease is especially prevalent in the hospitals in which cases of the disease have been treated, but it is not specially confined to the fever wards. Doctors and nurses in these hospitals frequently contract the disease.

It is very common for patients admitted to the Naval Hospital at Malta with surgical, venereal, or other affections to contract Malta fever after a stay there of a few days; and so commonly does this occur that it is sometimes necessary to question the advisability of sending patients to this hospital during the summer months.

The disease is also very prevalent in the Civil and Military Hospitals in Malta and in one of the hospitals in Port Said. In addition to this, it had been remarked by many observers, and by no less an authority than Hughes, that attacks of the disease may be localised to certain houses and barracks, and even to individual rooms, and to certain beds in a room. This, and knowing the fact that the disease cannot be conveyed by direct contact or by clothing worn by a patient, is of the utmost importance. Then, again, newly built houses and those near which building operations are going one, are specially prone to the disease.

Postulate 4.—Malta fever frequently occurs in epidemic form, the cases then invariably appearing one after another, not simultaneously, as if they were caused by a common means acting at the same moment. Examination of the recorded epidemics is very interesting in this respect, for those which occurred during the summer months show an interval of only one day between the cases, whilst in those which occurred during the cold weather this interval is often prolonged to three or four days.

Postulate 5.—Amongst the officers and men of the warships stationed in Malta the disease is, as mentioned before, very rife, but the manner in which these contract it is interesting. As a rule, when in Malta, these ships are moored in the harbours a short distance from the shore, which is steep-to; and amongst the crews of such ships the disease never occurs except in the case of men or officers who have recently spent the day or night on shore, or have a few days before returned from hospital. This fact we have verified by the most careful enquiries and observations. If, however, one of these ships goes into dry dock, or is moored alongside a wharf in Malta harbour during the summer, an epidemic of Malta fever almost invariably breaks out on board. The case has occurred when such a ship, having been in dock for some days, has then left Malta for a prolonged cruise, and a few days after leaving port an epidemic of Malta fever has occurred on board, one case appearing regularly after another with a one or two days' interval; and this has continued for two months, several of the cases then occurring amongst men who had not been out of the ships for weeks.

On these five epidemiological postulates we based our experiments, realising that infection in Malta fever is due in all probability to one definite and specific cause, which we determined, if possible, to find out, in order that prophylactic measures might at once be instituted.

This specific method of the transmission of the disease must therefore coincide with and account for all the above five postulales before it can be stated that the correct mode of infection has been discovered.

On my arrival in Malta in June, 1904, I associated myself with Surgeon Levick, R.N., and we agreed to start work at once.

The question then arose: Which would be the best method of working? We were then both surgeons in the Navy attached to different ships in the Mediterranean Fleet, and we knew that we should often be separated from one another, the ships rarely remaining in one port for any length of time, so that we could not experiment with monkeys or other animals; nor could we hope to make elaborate bacteriological analyses, for we were rarely at Malta, where, however, Dr. Zammit did his utmost for us; and we had no laboratories beyond the cabins in our respective ships. So we determined to repeat, so far as our circumstances would allow, the methods employed by Reed, Carrol, Lazear, and Agramonte for the discovery of the mode of transmission of

yellow fever, by endeavouring to obtain volunteers who with ourselves would be willing to undertake the experiments, to expose themselves to the probability of contracting the disease, and at the same time to live under such conditions as would reduce the possibility of error. Five others without hesitation at once volunteered to join us, so we determined to try upon ourselves every possible method of the transmission of the disease, and then by a process of exclusion eventually to hit upon the right mode of infection.

Up to the present time the *Micrococcus melitensis* has been found constantly in the blood of patients suffering from Malta fever, even in such a smal quantity as 5 milligrammes of the peripheral blood, and it has been found to be excreted intermittently in the urine; so that the possible modes of infection in Malta fever as in other analagous diseases are as follows:—

(*a*) By direct contact with Malta fever patients.
(*b*) By the clothing which has been worn by Malta fever patients.
(*c*) By urine-infected dust.
(*d*) By urine-infected water or food.
(*e*) By biting insects.
(*f*) Transmission in some way from some intermediate host.

Our first care was to assure ourselves that we were not immune to the disease; but as none of us had had Malta fever, and none of us had spent many months in the Mediterranean, and none of us had ever had any serious illness, we concluded that we were, some of us at all events, capable of contracting it. In addition we have all from time to time been tested with the serum reaction and this has always given negative results.

At first we proposed to experiment with artificial cultures of the micrococcus, but after much deliberation we realised that the results so obtained could only be inconclusive, for Nature does not work with agar cultures; and it is difficult to believe that under any natural conditions could the micrococcus occur in such numbers, such a degree of concentration and freedom from contamination as it is found when planted out on agar in the laboratory. As we could not afford to try experiments when their results would be inconclusive, we postponed the use of cultures until every other method of the transmission of the disease had been tried and failed.

We therefore decided to imitate natural methods as far as possible and to avoid artificially prepared materials for our experiments. From the outset we encountered some difficulties, as might have been expected. Chief of these was that we were constantly being separated, so that instead of being able to carry out the experiment with all the non-immunes simultaneously, we, as a rule, had to be content with three or four, and therefore each experiment had to be repeated and its result confirmed. Then we experienced great difficulty in obtaining materials to experiment with. Thus we frequently wanted to examine several patients in the hope of discovering some fact which would throw some light on the problem before us, or we wished to obtain urine from a patient, especially when it was known to contain the micrococcus, or we desired to allow recently hatched mosquitoes to bite a patient, who was willing that it should do so, in order that it might subsequently bite us, but we often encountered every conceivable opposition from those who had charge of such patients, and by those who are kept constantly acquainted with the ravages of the disease and apparently regard it in a state of lethargy from which it is impossible to wake them. Our work, therefore, is not as complete as it should have been had we been enabled to take advantage of every opportunity.

(*a*) We first considered the possibility of the transmission of Malta fever by direct contact. The possibility of this is remote, for although Malta fever is very prevalent in hospitals in Malta and other places where the disease is endemic, yet every year hundreds of men suffering from Malta fever are invalided to England and are treated in the naval and military hospitals at home, but the disease has never been known to spread in these latter hospitals; nor have nurses or orderlies ever been known to contract Malta fever at Haslar, Netley, Chatham, or Devonport. Nevertheless, as the opinion has been expressed that "One is driven to accept tentatively the unwelcome conclusion that Mediterranean fever is probably of a directly contagious nature" (Shaw), we attempted to reproduce the disease in the following way: A man suffering from Malta fever contracted in a Malta hospital was nursed in the ordinary sick-birth of a warship for a month by some non-immunes, who were in daily contact with the ship's company, but none of them contracted Malta fever.

This was repeated in another ship with another patient with the same result. Then on two separate occasions two non-immunes slept in the bedclothes which had been used by Malta fever patients, and still none of them contracted the disease.

This mode of infection does not agree with any of our postulates except possibly No. 3.

The conclusion is that the disease cannot be contracted in this way.

(*b*) Infection by clothing

Nightshirts which had been worn by Malta fever patients were conveyed on board four different ships and there slept in by four different non-immunes. They all remained well.

This mode of infection can only possibly agree with postulate 3; but it will not account for the increase of the disease during the hot weather nor its prevalence in ships which have recently been in dock. Then if the disease was transmitted by clothing or fomites it ought to spread in England; but it does not.

(*c*) Transmission by urine-infected dust.

In Malta, during the summer months, there is an almost complete absence of rainfall, and in consequence dust is blown about everywhere; in Malta, also, some of the people have an unpleasant habit of urinating in the streets, and therefore it seemed possible that the dust might become infected with the micrococcus excreted in the urine, and so passed from one man to another. It has been held that this is the chief means of the propagation of the disease.

We therefore mixed urine obtained from a Malta fever patient with some dust, and this was sniffed up the nostrils by two non-immunes, but they did not

contract the disease. This experiment was then repeated by four non-immunes, with the same result.

Unfortunately we were not in a position to demonstrate the presence of the coccus in the specimens of urine employed in these two tests; but as one of us had, previous to our determination, mixed a living culture with some dust and inhaled it without deleterious consequences, we did not repeat or continue dust experiments.

Infection by dust will not explain the prevalence of the disease in hospitals, nor epidemics on board ships when at sea. It is impossible to believe that a particle of infected dust should strike the nostrils of John Smith lying in Z Ward of the Naval Hospital at Malta, the remainder of the patients in that ward escaping, and another particle of urine-infected dust should strike the nostrils of William Jones lying in the same ward of the hospital three days later, and so on. Also ships at sea do not contain dust. This dust theory will not agree with postulates 3, 4 and 5.

(*d*) Infection by urine-infected water.

"The water-borne theory is on all sides considered improbable" (B. Smith). Epidemics do not follow the course of the water supplies in Malta. The incidence of the disease does not follow the course of that of typhoid. Hospitals are usually the last places to consume polluted water, and on board the ships of the Navy the water is distilled when at sea.

Infection by drinking water will not agree with postulates 3, 2, 4, and 5; but to make sure we mixed urine from a Malta fever patient with some water, and this was drunk by six non-immunes and none of them contracted Malta fever.

We made no experiments with food apart from water, except that four non-immunes drank some goat's milk which contained diluted urine in which the micrococcus was present, and they all remained well.

(*e*) Infection by biting insects.

I have stated elsewhere the opinion that this is the common and specific mode of infection in Malta fever, and up to the present time have met with no reason to alter that opinion.

Of all the methods of infection this seems to be the most probable one. It is the only one which will agree with all our postulates.

(1) The disease is endemic only in certain places; then it is probably conveyed by some insect which only inhabits these certain places.

(2) Malta fever occurs in the endemic areas all the year round, but its incidence is enormously increased during the summer months; some mosquitoes and biting flies live and bite in these endemic areas all the year round, but all biting insects increase enormously during the hot weather.

(3) Malta fever is specially prevalent in the hospitals where cases of the disease are being treated. When we know that it is not directly contagious and cannot be conveyed by infected clothing the insect-borne theory will alone explain the marked prevalence the disease has in hospitals and among nurses and orderlies in them. In hospitals, of all places, water and milk should be carefully sterilised and food carefully prepared.

Then the predilection Malta fever has for certain houses, rooms, and even beds, can only, in the absence of the conveyance of the disease by direct contact, or by clothing, be explained by the insect-borne theory. These last factors favour the transmission being by mosquitoes rather than by flies, for a mosquito will remain in the same room of a house or ship for months, so long as it can obtain a sufficiency of food in it.

(4) Then, again, during epidemics persons commonly contract the disease one after another in the hot weather, the interval between the cases being then short, for the mosquitoes feed regularly; but this interval is increased to two, three, or more days when the weather is cold, and when the digestive periods of insects is prolonged during partial hibernation. Mosquitos rarely fly off to the men-of-war in Malta harbours, but if a ship goes into dock then she is at once invaded by these pests and an epidemic occurs. Sometimes when such a ship goes to sea the epidemic continues because the insect remains on board conveying the disease from one person to another with a regular interval corresponding with its digestive period.

(5) Then amongst the crews of the men-of-war which have not recently been in dock the disease does not occur except in the case of men or officers who have been on shore a few days before. Every one on board necessarily consumes the same food and water, and fresh milk is never obtained by the men, so that this means of transmission by food and water seems improbable, and men must become infected by insects when on shore. The British sailor does not, as a rule, when he goes on shore at night on the spree, drink MILK.

We have experimented with many kinds of biting insects by making them imbibe the blood of patients suffering from Malta fever, and then allowing them to bite as many non-immunes as it was possible to arrange; but owing to the fact that we were living on board ship we had often the greatest difficulty in keeping the insects alive and making them bite regularly. In the case of *Acartomyia zammitii*, a mosquito which passes its larval stages in concentrated sea-water, which we have found in every place in the Mediterranean where Malta fever is known to be endemic, and which we in confidence thought to be instrumental in conveying the disease, we have been quite unable to make it bite regularly or to live long enough, with the means at our disposal, to give conclusive results. Had we been able to let loose in a mosquito-proof room a few infected mosquitoes of various species, and then been able to sleep in that room one by one, I am sure that we should have all of us contracted the disease, and its means of transmission been proved. Nevertheless, we did succeed in experimenting with some of the common species—namely, *Culex pipiens*, *Culex fatigans*, *Stegomyia fasciata*, and with fleas and bugs, but we did not apparently hit upon the right insect, for none of us contracted the disease.

Apart from this, very little work has been done upon this mode of infection in Malta fever. The Mediterranean Fever Commission has, it is true, made some experiments with *Stegomyia fasciata*, but so far as I am aware no other species of mosquito or kind of insect has yet been tried. Zammit claims to have succeeded in transmitting the disease from one monkey

From the MORNING POST, July 12, 1905.

A. Henley, to the
...son, to the *Carnarvon*,
10th inst.; and L... C. Pinsent, to the *New Zealand*, on completing, to date 11th inst.

Assist. Paymr. L. Blackler's appointment to the *New Zealand* has been cancelled.

HEALTH IN HOT CLIMATES.

Lieutenant-Colonel Giles, late of the Indian Medical Service, has produced "A Popular Treatise on Personal Hygiene in the Hotter Parts of the World." It should be of inestimable value to those who have to spend their lives in climates which differ radically from those in which they were born. The merit of the book lies in its clearness and simplicity. Taking it as a guide, an Englishman might provide himself with an ample medicine chest, select the best site for his dwelling-place, and have it erected on the soundest plans. He might thereafter, if far away from medical advice, guard against dangers to health, and deal with the earlier stages of such ills as may arise by simply using his commonsense under the precise and lucid directions given in various chapters of this book. In the opinion of the author, while it if hopeless to expect that anything in the way of actual colonisation can succeed in the climates with which he deals "with due care and attention to sanitary laws, as modified by the altered conditions, there is no reason why the rates of sickness and mortality should be much more formidable than elsewhere." Knowledge has increased enormously, and it is the application of it in daily life that is now most necessary. A very valuable feature of the book is that in which carefully-selected information is given about climatic conditions in various tropical countries. Colonel Giles expresses the surprise he experienced when, in collecting material for this section, he found himself "engaged in the preparation of what is really a pioneer work on the subject in the English language. But the slight efforts made to provide such data in a convenient form is suggestive of that carelessness which has led to the sacrifice of many lives. Much of the volume deals with India, where, as the author points out, the non-medical European has often to take measures for the protection of the indigenous community in cases of plague. Advice to all such is given along with good counsel as to the best ways of inducing the natives to accept sanitary precautions. Such a book as this should be regarded as a necessary part of the outfit for everyone going to reside in a tropical climate, and a careful study of its contents will be the best preparation for the dangers to health that may be encountered.

* Climate and Health in Hot Countries. By Lieutenant-Colonel Giles, M.B., F.R.C.S. London: John Bale, Sons, and Danielsson (Limited). 7s. 6d.

MEMORIAL TO LORD CHICHESTER.

TO THE EDITOR OF THE MORNING POST.

SIR,—All those who honoured and loved Francis Pelham

to another by *Stegomyia fasciata*, but he has been unable to confirm this result, and our experiments with this species have failed.

Apart from these experiments this mode of infection has been ignored, so that there still remains a great deal of work to be done before it can be said that this mode of infection can be excluded. Some arguments have been adduced against it, but they may be readily dismissed. The argument that because typhoid is not insect-borne Malta fever cannot be is not reasonable. It has been stated that the *Micrococcus melitensis* has not been discovered in sufficient quantities in the peripheral blood to render it possible for insects to infect themselves by biting Malta fever patients. This argument was made much of three years ago before the micrococcus had been discovered in the peripheral blood. It was repeated after it had been discovered in the peripheral blood. It was again repeated after it had been demonstrated in 1 cc. of blood. It was again repeated after it had been separated from 0·0005 cc. of blood. Perhaps it will be again repeated when it has been found in 1 milligramme of blood. It seems probable that the zenith of bacteriological method has not yet been arrived at.

Then it has been stated, "No known disease of bacterial origin (as contrasted with those of protozoal origin) has yet been proved to be insect-borne." Have we, then, so fathomed the depths of Nature's methods that we can afford to dismiss a possibility like this on the strength of a negative analogy?

The Mediterranean Fever Commission has produced the disease in monkeys in a variety of ways. These monkeys were kept chained to cages placed close together on an open stone causeway at the Public Health Laboratory at Malta.

Dust which had been mixed with the whole contents of three, four, or more agar cultures was blown into a monkey's cage periodically from July 10th until August 26th, and it was not until the latter date that the monkey showed signs of Malta fever. This was repeated in another monkey, only the dust in this case was blown up its nostrils. This was continued almost daily for a month before the monkey contracted the disease. Some monkeys were fed daily on whole agar cultures for more than a month before their blood reacted. These monkeys required, on the average, to be given the growths on twenty-seven agar slopes before they contracted Malta fever. These animals are always gnawing at their chains or the bars of their cages, and during the dust experiment had to be gagged, so that it is difficult to exclude the possibility of infection through the sores and abrasions thus caused, and the same applies to experiments with goats.

It is impossible to believe that under any conditions in Nature could a man partake of the number of micrococci found on twenty-seven agar slopes. If the minutest quantity of a culture of the micrococcus is placed under the skin, the disease is invariably produced after an incubation period of about six days; whereas these monkeys had to be fed for weeks before they contracted the disease.

While these experiments were going on, two other monkeys which had not been the subjects of any experiment at all contracted Malta fever. Some monkeys which had been the subjects of contact experiments also contracted it. Subsequently some other monkeys which had received injections of epidermal scrapings gave temporary reactions to Malta fever after varying intervals, but these were ascribed to the action of toxins, paddling about in infected urine, or to *Stegomyia*.

But is it not possible that these monkeys which contracted the disease "naturally," as Major Horrocks calls it, in reality contracted it in the only way in which it is commonly contracted, and the only way which has not been the subject of thorough experiment? One cannot help thinking that perhaps some of the monkeys which were the subjects of experiment also contracted the disease "naturally."

None of these monkeys were kept under mosquito-proof conditions, and consequently these experiments lose much of their value. We know that the disease does not spread by contact, or by clothing, or by the sweat, or by the breath, for if it did we should have Malta fever every summer in England; so that the inference is that some of these monkeys which were supposed to have contracted the disease by artificial means in reality contracted it naturally. Perhaps an infected insect was hovering in the neighbourhood of these monkeys, and it spread the disease from one to another, their infection not being the result of experiment at all.

We ourselves have swallowed reasonable quantities of the micrococci under conditions which precluded the possibility of insect infection and we all remain well to this day.

(*f*) Infection in some way from some intermediate host.

During the winter of 1904-1905 we were informed by Zammit that he had found goats to be susceptible to Malta fever, and he subsequently discovered that a large percentage of these animals in Malta were actually suffering from the disease which had been contracted naturally. As a result of this the *Micrococcus melitensis* was looked for in the milk of these animals and found in it. It was therefore at once concluded that the disease was transmitted from goats to man through the medium of the milk. This discovery was published broadcast and the matter was, by some, considered finished, for it was supposed that the goats contracted the disease by eating offal in the streets. But it was then discovered by Zammit and Shaw that cows also were susceptible to Malta fever, and that some of the cows in Malta had also contracted the disease naturally. It was then suggested that cows also sometimes eat offal.

We were all very much struck by these discoveries, and in consequence I at once wrote to the Medical Superintendent of a hospital in which several cases of Malta fever had been contracted and in which the disease was actually prevalent at the time, asking him to put these discoveries to the test by carefully sterilising all the milk supplied to his hospital and to watch results.

This he did on receipt of my letter (August). Milk had always been carefully sterilised in his hospital, but he made doubly sure of it by superintending the sterilisation of it himself. The result was that not only did the disease continue to occur, but he himself,

alone of his household, having always disdained the use of mosquito netting, first contracted benign tertian malaria and then a severe attack of Malta fever, from which he is still suffering.

In the meantime, on our return to Malta we determined to try the effect of drinking naturally infected goat's milk on as many non-immunes as it was possible to collect together in the short time we had at our disposal (seven days), but we were very disappointed to find that we could not obtain the milk in which the presence of the micrococcus had been demonstrated, so we had to be satisfied with the following test. We mixed a large loopful of a living culture of the micrococcus with some goat's milk, which, after keeping a few hours, was drunk by four non-immunes. One of these kept the milk too long, for after drinking it he had an attack of vomiting, but the others retained it well. To our astonishment nothing occurred, all the non-immunes remaining well; but we realised that at the best this experiment was artificial as we had used an artificial culture, but we were quite unable to obtain naturally infected milk. When we considered, however, the results of this and our former experiments and that all epidemiological factors point most strongly to the disease being insect-borne and against infection by the alimentary canal, we sought an explanation of the disease occurring alike amongst men, goats and cows under the insect-borne theory. We therefore debated the possibility of Malta fever not being conveyed by milk or the eating of offal, but by insects which transmitted the disease to all these animals. If this was the case, then one would expect that some other animal which did not under any conditions eat offal or drink milk, and which lived in Malta, would also commonly suffer from the disease.

I, therefore, being away from Malta at the time, wrote to Dr. P. Micallef, of the Public Health Department in that Island, asking him to examine the bloods of as many horses as possible to see if any of them reacted to Malta fever.

This he did at once. He has examined up to the present the bloods of thirty-eight horses of which four reacted to Malta fever. As one cannot accuse horses of eating offal in the streets or of drinking goat's milk, and taking into consideration our experiments and the epidemiological factors herein set down, one must conclude that although the micrococcus is present in goat's milk and is excreted in the urine of men and animals suffering from the disease, yet it is in all probability not conveyed by the drinking of milk or the eating of offal, but by an insect, as yet undiscovered, which transmits it from person to person, goat to goat, cow to cow, and horse to horse, and possibly from one of these animals to the others.

Lastly, from the epidemiological factors and the experimental work done, the possibility of the disease being conveyed by dust, water, food, or direct contact seems highly improbable.

It behoves us all, therefore, who are in daily contact with the disease, or who are interested in it and are able to do so, to search diligently for the mosquito, biting fly, or other insect which conveys it, and when found to institute means for its extermination.

THE MOSQUITO WORMS OF TRINIDAD AND THEIR REAL NATURE.

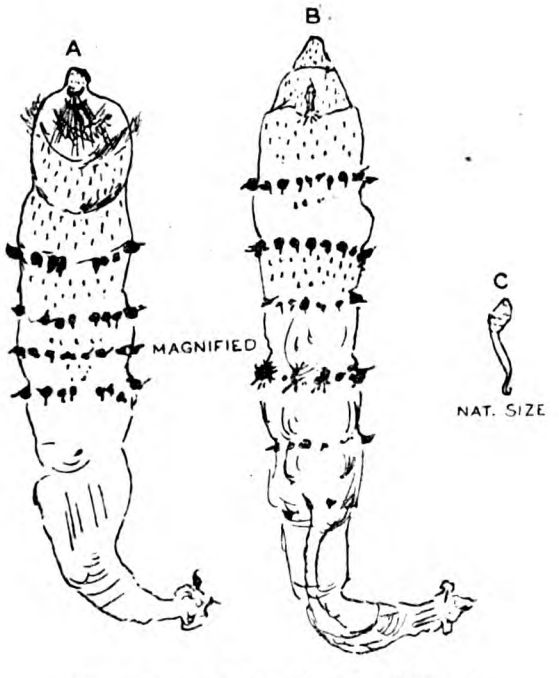
By A. J. B. Duprey, M.R.C.S., L.R.C.P.
Mayaro, Trinidad, West Indies.

In Trinidad, more than any of the other West Indian Islands, cases of external myiasis are not of infrequent occurrence. This is especially the case in this district, where the presence of various parasitic diseases is mostly due to the extensive tracts of purely virgin forests in an, as yet, uncultivated part of the country, and in which abound all kinds of biting and venomous animals. The traveller in these forests will experience very great annoyance through a myriad of flies and other insects of all sorts and sizes, some even beautiful and glittering in their varied colourings of blue and green, keeping up a continuous buzzing for miles of forests through which the wayfarer travels. Fortunately for man, who is well able to defend himself, these flies, with the exception perhaps of the undaunted mosquitoes, do not often attack him; but the poor animal which he bestrides is not infrequently blooded to a considerable extent. Often the hunter or the planter, after his bush excursions, finds that he has been bitten, as he thinks, by mosquitoes, which fact in itself is not at all surprising, but he discovers later that there are four or more very irritable and bumpy spots about his body, usually on the hands and face, sometimes on his legs, for which he cannot account. The experienced bushman knows these to be mosquito worms, and awaits patiently for a day or two, when the worms shall have matured, and forthwith takes the necessary steps to rid himself of them. The uninitiated, however, continues to rub the irritable spot until he finds that, instead of subsiding, a not inconsiderable blush of inflammation has spread around the original bump, where he may notice a small aperture about the size of a pin's head, from which exudes a sero-purulent discharge. A knowing one now sees this inflamed spot, and at once recognises the nature of the condition; he proceeds either to squeeze out the worm, or, if the part is very painful, he applies a little plaister over the aperture usually, among the labourers, made of brown paper coated over with a soft tallow. The worm being an air-breather soon dies, after which it can be readily squeezed out. On account of the knowledge and experience which the labourer has of quickly ridding himself of this worm a case is seldom allowed to go far enough to require the services of a medical man, so it comes about that the doctor rarely sees a case. I had the opportunity of seeing a very severe case of so-called mosquito worm infection a short time back, and as I had no idea of what a mosquito worm was I was naturally much interested in the case.

The patient had been out on an excursion in the woods for the greater part of the day, and, as a consequence, was infected in the lower third and outer aspect of his left thigh, where there was to be seen a round hole about the size of a No. 9 shot, from which pus exuded on slight pressure. The surrounding inflammation was fairly extensive and indurated, of a bright red colour, and acutely sensitive. The constitutional symptoms were severe: he had a thickly coated tongue, a febrile pulse, and really looked very

pale and ill. On the front of his leg on the same side there was an angry and weeping eczematous eruption, probably also of a parasitic nature of some kind, which easily subsided on treatment. A little 1 in 40 carbolic lotion syringed in the aperture quickly killed the worm, and on the following day, after the subsidence of the inflammation, the worm was extracted. This latter was not kept for my inspection, but the gentleman gave some description of its appearance which caused me to think it was the larva of the *Dermatobia nonialis*. An abscess developed in his thigh, which was opened a few days after by a doctor in Port of Spain.

Some weeks after another gentleman came to show me several little swellings on his face and hand, which he said were mosquito worms. There were no less than four on his chin, over one of which he had placed the proverbial plaister, and one on the back of his left hand. The swelling over which the plaister was placed was the size of a pea, and two small holes could be seen where entrances were effected. The bump was very painful on pressure, and the man said that the worms were not ready to be squeezed out, but that he would return on the morrow. The little swelling on his hand was a mere papule, in the centre of which was the minute aperture of entrance, very much like a mosquito bite (hence the name of mosquito worms). It was extremely irritable, and I noticed the man rubbed it continually. On the morning of the next day he came again, when I squeezed out two little worms from his chin quite close to one another, from the examination of which I made the following drawing.



Dermatobia nonialis "Mosquito Worms."

The larvæ belong to the genus *Dermatobia*, which are variously described by authors; the length and size vary considerably according to the stage of development. The larvæ are whitish in colour and club-shaped, the handle-part of the club or posterior extremity being furnished with the respiratory apparatus. There is, I think, some mistake made with regard to the mode of infection. The larvæ are described as though the fly actually deposits her eggs directly in the skin of man, dogs, or wild animals. Scheube says "it mostly lays its eggs in the skin of cattle, sheep, and dogs, and sometimes in the skin of man"; and Manson, in his "Tropical Diseases" (1898 ed.), says the same. Daniels thinks "man as well as animals may be attacked." It may be said here that the fly never attacks man or animals directly, but that the eggs are deposited on leaves and branches in wooded lands and forests, and thus man, hunting dogs and other wild animals in passing through get the larvæ deposited on them accidentally. I believe this is evident from the fact that, though the affection is common in Trinidad, no one has as yet seen the fly or can tell in what way the worms get deposited on the skin. The presence of the *Dermatobia nonialis* is not even suspected, seeing that the worm is attributed to the bite of the mosquito. I am inclined to think, therefore, that the nature of the mosquito worms has never been recognised in Trinidad. I have never heard of the existence of the Dermatobia in the other British Islands of the West Indies.

IS MALTA FEVER PECULIAR TO MALTA?

By Llewellyn P. Phillips, M.D., M.R.C.S., F.R.C.S.
Cairo, Egypt.

In a leading article on this subject in the Journal of December 15th, you state that Malta fever is infrequent and rare elsewhere than in Malta. Now the following facts will show that it is far from rare in Egypt, the evidence for its occurrence not resting on clinical facts alone, but also on the agglutination test.

Cairo.—In Cairo this year five cases of Malta fever have been under my care, a short *résumé* of them being as follows:—

(1) A Coptic lady who lived in Cairo and who had not left it this year, called me in to see her in October; she had been ill for about three months with a fever which was constantly relapsing, and had been treated for malaria with no success. I suspected Malta fever, and had her blood examined by Dr. Dryer, the medical officer of health for Cairo; it was found to agglutinate the *Micrococcus melitensis*. She had a subsequent relapse, and still remains ill.

(2) Another Egyptian called me in a few days later, and told me that he had Malta fever. He lived some six houses away from the preceding case in the same street. He had been ill for about eight months. The original attack occurred in Cairo, but was not suspected. He then went down to Alexandria, where a relapse occurred. An agglutination test was then applied, and gave a positive result of 1 in 500. He then went after that to Vienna for the summer, and promptly had another relapse. Professor Nothnagel saw him there, and had a further blood examination made. This was positive in a dilution of 1 in 1,000. When I saw him he was in his sixth relapse, which

was of the undulant type, and proved to be the last. In December his blood was again examined and agglutinated the *Micrococcus melitensis* in a dilution of 1 in 300.

(3) A Berberin servant living in Cairo was admitted to Kasr el Ainy Hospital under me with what I at first diagnosed as rheumatic fever, there being pains and sweats; a systolic mitral murmur developed. He was put under salicylates and kept on them for ten days, but with no effect, so I stopped them; the temperature then ran up to 105°, but came down with cold sponging. I now had his blood examined, with the result that it agglutinated the micrococcus of Malta fever. Meanwhile I put him on liquor hydrargyri perchloridii in drachm doses, his temperature came down and remained down, and he slowly got well.

(4) A Cairo policemen was attending my out-patient department for some weeks with what was apparently chronic rheumatism. Two weeks running his temperature was 100°, so I had a blood examination made by Dr. Ferguson, with a positive result for Malta fever. He, however, refused to be admitted into hospital.

(5) This was the case of an Englishman who was employed in the Cairo police stores. It is particularly interesting, as he had a double infection with typhoid fever and Malta fever. I intend publishing the case in detail shortly.

He was taken ill in September with diarrhœa and fever, and in fact went through a severe attack of typhoid fever, with a positive Widal reaction. He was very delirious and nearly died. This was followed by a relapse of the same nature. After an interval of some twenty-five days again he had a relapse, with signs of bladder irritation. The fever did not, however, subside, but became remittent in type; he having served in Malta some years ago he said he thought he had "slow continued fever," which he said was common in Malta, but which he escaped there. I had a specimen of his blood tested by Dr. Dryer, with the result that it agglutinated the micrococcus of Malta fever. A second specimen a week later still agglutinated the *Micrococcus melitensis*, but no longer agglutinated the typhoid bacillus. I treated him with sodium thiosulphate, as suggested by Dr. Betts, and found useful by him at Port Said, but with no effect. I then gave him perchloride of mercury as in the former case, with excellent results. In fact, I believe that perchloride of mercury given whilst the fever is coming down at the end of a paroxysm and continued for some time, is very efficient in cutting short the disease.

Besides these cases which were under me, there were several others admitted to the Cairo Fever Hospital, in whom the nature of the disease was proved by the agglutination test.

In Port Said there has been quite an epidemic of the disease, the doctor of the Government Hospital himself contracting the disease. Whilst under my care for it at Cairo, he told me that he had treated about a hundred cases there during the last few years, many of them being confirmed by the agglutination test.

I therefore consider that the fact is undoubted that Malta fever occurs endemically in Egypt.

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THE

Journal of Tropical Medicine

JANUARY 15, 1906.

A PLEA FOR UNIFORMITY AND GREATER OFFICIAL SUPPORT IN THE COLLECTION OF COLONIAL CLIMATIC DATA.

METEOROLOGY is a science that, perhaps more than any other, is dependent on amateur effort; for the professional meteorologist is one of the rarest of the scientific fauna; a dozen or so sufficing for the needs of even a good-sized kingdom. Many of our colonies are absolutely unprovided with specialists in this branch of knowledge, the work being handed over to the astronomer, where such a scientific luxury is indulged in, or elsewhere to the medical authorities "in addition to their other duties"; and everywhere the rank and file of the official observers are furnished by the medical services.

Doubtless, by virtue of his scientific training, the medical officer is usually the best man avail-

able for the purpose; but against this may be put the fact that, like a woman's, a doctor's work is never done, so that he is liable to be called away at any time and so perforce neglect this less important item of his duties.

Now, to be of any real value with the customary equipment, meteorological observations must be taken punctually at stated times, and it would therefore be probably better if more usually engineering officials, who are less liable to irregular calls, were chosen for these duties.

As matters stand, the actual taking of the observations must necessarily be often deputed to native assistants; and the result is that personal observation becomes irregular, and the medical officer necessarily loses the personal and continuous interest in this branch of his duties, which alone can secure valid results.

During the writer's work in unearthing climatological data from official sources he met with the most ludicrous instances of this sort.

Observations at stated hours recorded as above the maximum or below the minimum of the same days; wildly impossible readings of the differences between the wet and dry bulb thermometers and deliberate fudging. In one case an entire year's observations were cooly copied, figure for figure, from a previous year. Of course such a case as this implies not only neglect of personal observation but an entire absence of any attempt at supervision. Such lapses are, however, far more excusable than at first sight appears.

The most exact and careful series of personal observations may be utterly spoiled by the advent of a baby or a surgical emergency, and practically the actual observation must often be left to a ward coolie or even a private servant, who at most can barely read.

Under such circumstances it is impossible for the work to be *well* done, however keen the medical officer may be; and no man can be fairly expected to take a genuine interest in any work unless he is so circumstanced as to be able to do it thoroughly.

Under these circumstances it is by no means surprising that one has to exercise considerable care in selecting observations, and must needs often reject a large proportion of those recorded or purporting to be so.

In one case, indeed, a discriminating superintending medical officer refused to record an entire year's observations, as he had convinced himself that they were entirely valueless.

This condemnation was probably too sweeping, as the records were probably neither better nor worse than the average, and doubtless included many that could be picked out by an expert as sufficiently reliable for inclusion as components of averages; but it is obvious that the administrative officer could not take this course without exposing to reprimand overworked officers, excellent and energetic in their proper duties; and whom he knew under existing circumstances could not fairly be expected to take any genuine interest in this by-path of their work. To expect observations at stated hours from medical men of any class is to demand an impossibility, and the farce of attempting to do so should cease. When no other observer is available the observatories should be supplied only with self-recording instruments, which can be recorded and set at almost any time of the day.

Instead of this, however, the equipment of colonial observatories is of the most variable and often of a needlessly complicated sort. Moreover, even where observations taken at stated hours bear the impress of care and exactitude their value is greatly discounted by the fact that they are not uniformly taken at the same hour, even within the limits of a single colony; and are, therefore, useless for purposes of comparison, and after all the main value of all such observations is comparative.

The reason for this deplorable want of system and wasted labour and opportunity are not far to seek, and lie in the fact that, in spite of the enormous extent and value of our Colonial Empire, this rich country does not afford itself even a single specialist to collate and systematise the reports coming in from all parts of the world, on a subject which may, without exaggeration, be affirmed to afford some of the most indispensable data for all rational sanitary and economic progress. Without this knowledge the sanitarian

is unable to pronounce what measures promise best for the vulnerability of the parasites which cause most tropical maladies of man and beast, as these depend more than anything on the intelligent application of an accurate knowledge of the climatic peculiarities of a region — while on the economic side, who can say what sites are likely to be suitable for the growth of cotton and other crops, without accurate and systematic information on this vitally important subject.

Enormous sums have been and are being wasted on bootless experiments of this sort; while a tithe of the cost would suffice to equip and maintain an adequate colonial and central staff for the collection and publication of this most indispensable class of information; but just as our armies have had to blunder through unmapped areas of our own territory, so must those who would exploit the latest resources of our colonies blunder into unknown climates.

Let us hope that our new Liberal Government will show itself liberal in more than name in this matter, for it is humiliating to turn from the climatological returns of our own colonies to those of other governments, which usually show a much better claim to the title in the best interpretations of the word.

Science, however, in any form can expect little encouragement from any English government, but pending the unfortunately very unlikely consummation of money being spent on this most important and certainly remunerative object, something at least might be done in the direction of uniformity and in the simplification of the equipment of observing stations. With the exception of observatories at the seats of Government where a specially trained subordinate should be detailed for the work, in addition, perhaps, to clerical duties, all observatories working at stated hours should be done away with, at any rate, if they are to be conducted through the agency of the medical services. Barometric observations have but little interest to the climatologist, and are only useful for weather forecasts when combined with simultaneous telegraphic reporting over large areas; and such observations might very well be omitted from the ordinary stations, which should be equipped with only a rain gauge and maximum and minimum dry and wet bulb thermometers. Under this system five instruments only would have to be attended to *once a day*, and it would be a matter of no moment what hour of the day was selected for the purpose; nor, within very wide limits would it matter if the hours of observation were the same; though probably some time in the evening would be most convenient for the purpose, in which case the observations might be recorded at any time between 4 p.m. and midnight, at the observers' convenience.

A sixth column should be added to the form for a statement of the average amount of cloud, and in certain cases, perhaps, a sixth instrument might be added, in the shape of a wind vane.

The data suggested afford the maximum and minimum and range of temperature of the day definitely, while in the case of temperature the average of the maximum and minimum approaches so closely to the true mean temperature of the day that it is adopted as such in many countries. It also furnishes definitely the maximum and minimum relative humidity of the day, and the average of these, though constantly less than the true mean, is exactly comparable with the means of other stations where the same system is adopted.

It gives also the amount of rainfall and the number of rainy days, while the complement of the amount of cloud gives the proportion of insolation received at the station. The monthly and annual means derivable from these figures should be calculated at the station of observation, but it is better that the calculation of the relative humidity, from the wet and dry bulb data, should be left to those who make use of the information, as it introduces a second source of error, and so renders the value of the records less easily appraised by the expert.

The "screens" for the exposure of the thermometers should be of uniform pattern, and should, in all cases, be placed beneath a thatched shed about twelve feet in diameter, open at the sides, and well clear of neighbouring buildings, and the site chosen should be one which the

observer must visit in the course of his other duties in the evening, or be placed near his private quarters. The form of record would then run as in the example below.

STATION, *Jaipur*. LAT. *26° 55'*. LONG. *75° 50'*.
HEIGHT ABOVE SEA, *1,430 feet*. MONTH, *May*, 1907.

Date	Dry Bulb Minimum	Wet Bulb Maximum	Dry Bulb Maximum	Wet Bulb Maximum	Rainfall Inches	Proportion of Cloud	Remarks
1	79·2	66·1	104·5	80·2	0	1	*Heavy dust-storm*
2		&c.,	&c.,	&c.			
31							
Means*							

Heaviest rainfall of a day, . Number of rainy days, .
Signature.

* NOTE.—In the case of rainfall, the total and not the mean of the month should be given.

It may be fairly claimed that all really important climatological data are included in the scheme outlined; that the facts required can be collected with the least possible trouble to the observers, and, the most important of all, that they are easily comparable.

Lastly, it may be pleaded that the reform is one that would cost nothing more than the few shillings required for the purchase of the two wet bulb thermometers, and that it can be effected literally by a stroke of the pen of the Colonial Secretary.

CO-OPERATIVE RESEARCH IN CLIMATOLOGY.

IN presenting to our readers the first "Climate" issue of the JOURNAL OF TROPICAL MEDICINE, the Editors desire to impress upon the alumni of the Livingstone College who have done so much to give interest to the pages of CLIMATE, now incorporated with this publication, that they look to them to continue the literary and material support afforded to its predecessor.

No class of men are better placed than the ex-students of that College for prosecuting and advancing the study of climatology, for they penetrate to the uttermost corners of the world, and are often stationed for long periods, where other white men at most pay only flying visits, and they can thus render immense service to science by undertaking systematic observations at the scene of their labours.

The Jesuit missionaries have in a variety of localities done work of this sort of the greatest value, and surely Protestantism, which prides itself on its more liberal attitude towards science, should not allow itself to be put to shame by these self-sacrificing pioneers of civilisation.

The trouble and expense involved in systematic observations of this sort is singularly small, for the instruments can be bought for a sovereign, and five minutes daily is all the attention required. The Journal will be glad to furnish any gentlemen desirous of taking part in these investigations with a set of forms for each year's observations, and it is needless to say will gratefully publish the results when transmitted to them, besides which it is proposed to afford some little recognition of the service rendered to science by a complimentary gift of appropriate literature.

The Editors' idea is in fact to make the Journal the organising centre for the systematic extension of our knowledge of tropical climatology by the medical profession and the alumni of the Livingstone College. English meteorology would be in a most backward state but for the efforts of the Royal Meteorological Society, and it is our ambition to do something to emulate its invaluable work by organising the systematic study of the climatology of the back of behind. We indulge in the hope that a considerable number of gentlemen may be induced to participate in this scheme of co-operative research.

In the next (April) climatological number it is also proposed to include a short series of articles on the methods and aims of observations of this sort and the physical facts on which they are based.

DR. CHARLES F. HARFORD'S LECTURE AT CAMBRIDGE.

DR. HARFORD has devoted considerable attention to the best methods of interesting that section of the public who are concerned in various enterprises connected with the Tropics and especially those who go abroad as missionaries. His work has chiefly centred round Livingstone College, where a special course of training on well-defined lines is given to missionaries. Besides this he has organised several exhibitions of outfits for the Tropics and has sought to influence a larger circle by means of *Climate*. On Wednesday, November 22nd, 1905, Dr. Harford addressed a University audience in the anatomical theatre by the invitation of Professor MacAlister who, by a strange coincidence, was attacked by malaria on the very afternoon of the day, as the result of his

recent visit to Palestine, and so was unable to be present.

The lecture had the support of all the professors and teachers of the Cambridge Medical School, and Dr. Nuttall most heartily co-operated to make the occasion a useful one by arranging a demonstration of drawings of parasites and many interesting diagrams, and he, as well as Sir Patrick Manson and Major Ross, had lent many of the lantern slides which were shown at the lecture, which proved to be a valuable opportunity of setting forth the urgent necessity of spreading a knowledge of tropical health problems, and showing what is being done in this direction.

The chair was taken by the Master of Trinity who, in the course of a most interesting speech, strongly urged the importance of preventive medicine and illustrated his remarks by reminiscences of Jenner in the early days of vaccination. He also drew attention to the recent sanitary measures at Panama.

The lecture, which was entitled "Risks to Health in the Tropics: their Relation to Imperial Expansion and Missionary Enterprise," was a type of how a subject of the kind ought to be presented to the public. The necessity for educating the public in this country, in the meaning and nature of the chief scourges which attack our fellow-subjects in many parts of the Empire, may appear to many "stay-at-homes" of academic interest merely; but even to those who have never personally known what the dangers of a tropical climate are, but who take wider views of our imperial duties, let alone their humanitarian aspects, the subject of the health of both the white and coloured populations of the tropical parts of the Empire is one closely bound up with our daily life. If education in these matters is of direct interest to dwellers in these islands, how much more personal and immediate is it to the hundreds of millions of men and women who are exposed to the deadly diseases which prevail around them. Instruction how to protect themselves and to ward off disease from their children is a factor in their life which has hitherto been neglected; but, thanks to recent scientific discovery, it is now possible and ought to be the duty and pleasure of every man and woman who is capable of giving it. Dr. Harford brought out this point most clearly in his lecture and it is hoped his audience took the lesson to heart. Dr. Harford, in advocating the means whereby disease in the Tropics is to be fought, did not commit the mistake of advocating this or that nostrum, but strikes at the root of the matter by stating that the chief prophylactic measure we possess consists in the education afforded to medical men practising in the Tropics by the Schools of Tropical Medicine in London, Liverpool and Cambridge. He also pointed out what is being done at Livingstone College in educating missionaries in the rudiments of tropical hygiene. This most beneficent development is one of great national importance, for in many parts missionaries are the teachers of the children; and the education the missionaries receive at Livingstone College eminently fits them to give reliable instruction based on scientific methods in the schools under their charge.

At the London School of Tropical Medicine no fewer than 550 medical men practising, or destined to practise, in the Tropics, had already taken out the course of instruction provided by the School. The Liverpool School of Tropical Medicine had gained a world-wide reputation by the numerous expeditions it had sent to gather information and to teach how disease is to be prevented. The Cambridge School had placed its laboratories at the disposal of men interested in Tropical Medicine, and had raised the status of this branch of medicine by granting a diploma in Tropical Medicine and Hygiene. At the Livingstone College 248 missionaries have availed themselves of the privileges there granted them, and have gone forth equipped in a measure unknown to their predecessors in the missionary field.

The lecture at Cambridge was amply illustrated by lantern slides, and, like all "teaching" lectures, the bald text is apt to appear meagre in comparison to the actual instruction conveyed. Dr. Harford, in his lecture, stated the principal diseases met with in the Tropics, and showed how many of these diseases were conveyed, and how they were to be avoided. He showed by simple tables the meaning of heat and moisture in a tropical, compared with a temperate, climate. A short account of the malarial parasite, its development in the blood of human beings and in the mosquito, and its mode of transmission by a particular species of mosquito, was illustrated by lantern demonstrations. Yellow fever, filarial ailments, and tick fever were dealt with in the same manner; nor was ankylostomiasis neglected. The methods of stamping out malaria advocated by Major Ross, and successfully employed by him at Ismailia, and by Dr. Malcolm Watson at Port Swettenham, were cited as instances of how malaria may be prevented by the destruction of mosquito breeding grounds. Dr. Harford, in his summing up of the subject-matter of his lecture, again advocated the necessity of educating not only the medical men, but also the natives, and especially the children in the schools, in the manner which had been so successfully carried out in the colony of Lagos on the West Coast of Africa. J. C.

Reviews.

A Handbook of Climatology. By Dr. Julius Hann. Translated from the Second German Edition by Robert De Courcy Ward. New York and London: Macmillan and Co. Part I.

We have nothing but praise for this much-needed translation of Professor Hann's well-known work, as it forms the only available book on the general principles of climatology available to the English reader, in which the subject is at all exhaustively treated.

The original German work consists of three volumes, the second and third of which are devoted to regional climatology; and we think Professor Ward is well advised in confining his translation to the first volume, which deals with the general principles of the subject. Regional climatology is obviously better dealt with by local experts than by a writer whose experi-

ence is necessarily mainly confined to Europe. The book, however, is something more than a translation, for in addition to the examples cited by the original author, parallel cases, drawn mainly from American experience, have been added by the translator, which, even if they do not appeal specially to the English reader, at any rate make the illustrations fuller. Much new matter has also been added to bring the book up to date, together with plentiful references to English papers on the subject.

All this adds greatly to the value of the book, but best of all, the translation has been done into excellent English, so that involved confusion that appears inseparable from German prose composition is converted into a clearness of expression almost French in its style. The number of full stops has been, we should think, at least doubled, and the commas proportionately reduced in number, characteristics which make the reading a pleasant contrast to the general run of translations from German authors.

May we express a hope that Professor Ward may see his way to giving us a work on North American climatology; as encyclopœdic as are the publications of the American Weather Bureau, the very completeness of the work of that model national institution making it extremely difficult for Englishmen (we refuse to say foreigners) to gain any clear idea of the climatic characteristics of the vast area with which it deals.

A Handbook of Climatic Treatment, including Balneology. By W. R. Huggard, M.A., M.D., F.R.C.P. London: Macmillan and Co., 1906.

There are probably no specialists who more frequently require to prescribe "change of air" than those who deal with tropical diseases, whether while acquiring a hard-bought experience abroad, or when in after years the returned Tropical physician is sought out by the returned layman. Those still practising in the Tropics are continually meeting with cases in which change is not merely "indicated," but is an absolute matter of life or death; and the puzzle always is, where to send them. As a rule, the practitioner is content simply to get a patient out of the Tropics by the shortest route, with the result that he makes straight for his native place—perhaps Edinburgh in March—and is rewarded by a severer and more prolonged bout of malarial fever than he has had to endure in his entire tropical experience. The tropical practitioner's library must needs be select, if not absolutely scanty, and if it contain no work on health resorts he is hardly to be blamed; as it must be confessed that a large proportion of so-called balneological literature savours too strongly of the patent medicine vendor, the reader finding that the vaunted locality is "contraindicated" only in ingrown toenail and the acute stage of bubonic plague.

The work under review, however, concerns itself mainly with general principles, and is entirely free from pretentious matter of the sort alluded to, so that we feel sure it will be most useful to those who require a convenient epitome of climatic treatment, and to none less than the tropical practitioner.

We say this, albeit tropical maladies are scarce mentioned in its pages, and the word malaria does not occur in the index, although there is a casual mention that malarial convalescents do well at Davos, a fact well known to most tropical specialists, with the reservation, of course, that they must be re-acclimatised in some moderately warm, dry climate before they can be considered fit for so tonic and bracing an environment.

It speaks highly, too, of the book, that even in the case of the author's own station of Davos, the contra-indications are numerous and evidently the outcome of thoughtful experience.

Of the 520 pages to which the work runs, the first 60 are devoted to meteorology from the general point of view, and we are least pleased with this portion of the work, as it occasionally lacks the clearness of the rest of the book; some of the explanations being rather hard to follow, even to one fairly conversant with the subject. To our thinking, the space devoted to the subject, while far too short for exhaustive treatment, is too long for an outline, and there are occasional errors, as, for example, the explanation of the comparative coldness of the upper layers of the atmosphere, which is said to be "mainly due to the physical law of the expansion of gases." Now this law explains only the rather exceptional case of the coldness of up-hill winds, but the absorption of heat from expansion under these circumstances would rapidly be replaced by the sun's rays; were it not for the true reason, which is the universal operation of the law of selective absorption. Air, whether dry or wet, is very transparent to short-wave rays, but absorbs the long dark heat waves, such as are radiated by the ground, and therefore acts in the same way as the glass of a greenhouse, forming a sort of heat-trap. The more dense the atmosphere, the more efficient it is in this respect, and hence naturally the rarer upper regions, being less efficient heat-traps, do not trap as much heat.

Moist air is a much better trap than dry air, but this does not affect the explanation, as under any circumstances the upper layers would be to a greater or less extent cooler. In a book devoted mainly to the sanitary aspects of meteorology we should have expected better information as to the composition and effects of town fogs, but the subject is dismissed with a mere casual mention, and F. A. Russell's researches on London smoke deposits are not even noticed. Speaking generally, indeed, the bibliography of the subject is most scantily treated, so that the book affords but a poor guide to those whose interest having been aroused, would wish to follow up some point further. The construction in these chapters, too, is often loose; on page 47, *e.g.*, we are told that "the black bulb registered 55·5° C., while at the same time the temperature of the snow in the shade was 5·5° C." We presume the air over the snow is meant, for at 5·5° C. the snow, of course, would become water. Again, we are told at page 211 not to put faith in meteorological tables, when the author merely intends to caution us against comparing tables that, owing to varying hours of observation, &c., are in no way comparable; for he evidently very properly regards meteorological data as the only sound source of information. Still, such tables are rather wanting, and he cannot help wishing that the greater portion of the first 60 pages had been devoted to terse tabular statements of

monthly climatic data in connection with the various health resorts discussed. Other instances might be given, but we are not concerned in picking holes in a really meritorious piece of work, which can be thoroughly recommended to those who require a handy reference book of the subject.

PROFESSOR DAVIS ON THE EFFECTS OF ARIDITY.

THE current number of the *Geographical Journal* includes a paper on "The Geographical Cycle in an Arid Climate," by Professor W. M. Davis, which will be read with especial interest by all whose work has led them to such ill-favoured regions. The "geographical cycle is the period in which an uplifted land area will, if no disturbance occur, be worn down to base line by the processes of erosion." The absolute duration of such a cycle, therefore, varies enormously in proportion to the activity of the erosive forces, and tends to be indefinitely prolonged under conditions of aridity, where denudation by rain is insignificant, and the effects of wind only tend to predominate. The characteristics of the resulting desert landscape are broadly indicated, and will afford interesting food for reflection to those who have opportunities of visiting such scenes.

PROFESSOR KOCH'S WORK IN EAST AFRICA.

THE current number of the *British Medical Journal* contains a good abstract of Professor Koch's preliminary statement of his work in East Africa. The subject is, however, far too important to the special class of students of Tropical Medicine to be dealt with in this way in our pages. Its translation *in extenso*, and the reproduction of the numerous illustrations, are in progress, but necessarily take some little time to carry out. We hope, however, to be able to provide our readers with the paper in English dress in the first issue of the month of February.

SCORPION POISON.

So little is known about scorpion poison that it is satisfactory to find that the subject is being taken up by MM. C. Nicolle and Catouillard, who have been experimenting on the poison of the common North African species, *Heterometrus maurus* (*C. R. Soc. de Biologi*, 1905, pp. 100-102). So far their experiments do not seem to promise well for the discovery of either an antidote or a protective serum, as small doses conferred no immunity on rabbits. Antivenomous (snake) serum also has no protective action, though this could hardly be expected, as scorpion poison does not appear to resemble any form of snake poison.

At the same time, there must be some method of producing immunity, as all who have been in the East know that certain individuals, usually fakirs, obtain a curious power of handling these animals, and will allow themselves to be stung without suffering any apparent inconvenience. G. M. G.

THE LONDON SCHOOL OF TROPICAL MEDICINE.

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Original Communications.

NOTES FROM ANGOLA.

By F. C. Wellman, M.D.

Corresp. Memb. Am. Soc. Trop. Med.

(*Concluded from p.* 345.)

Note XIX.—The Occurrence of an Embryo Intestinal Worm in the Blood Stream and its Conceivable Import.

The worm seen by me in the blood of an Angolan negress, and described in the Journal for February 15th, 1904, has been pronounced the larva of an intestinal parasite. Looss' discovery that larvæ of *Uncinaria duodenalis*, after piercing the skin, leave the subcutaneous tissue in the blood stream, and, passing through the right heart to the lungs, travel up the trachea and down the œsophagus to the stomach and intestines, has suggested to me that my worm may possibly be the larval form of some other intestinal parasite which, when observed, was in the process of reaching, by a similar route, its normal habitat in the alimentary canal. It may turn out that several forms of helminthiasis can be prevented by cleanliness of the skin.

Note XX.—On the Possible Heterogenesis of Auchmeromyia luteola, Fabr.

While engaged in working out the complete life-cycle of *A. luteola*, I was recently told by the blacks that its larvæ were capable of both sucking blood like a tick and also of embedding themselves in the skin. Further enquiry was rewarded by the appearance of a native with a small swelling in his side, from which I extracted a maggot identical (in size, shape and, so far as I could see, every detail, including the mouth parts) with the usual hæmophagous larva of *A. luteola*, so common in this region. I have since looked for, but hitherto failed to find, more than this single instance. It would be interesting should these anomalous blood-sucking maggots prove to be capable under certain circumstances (possibly when the skin is slightly broken from any cause) of causing, like their allies the larvæ of *A. depressa*, ordinary cutaneous myiasis in addition to their equally disgusting *role* as vermin.

Note XXI.—Quartan Malaria in Tropical Africa.

The writer for some time thought that probably the malignant parasite was the only form of malaria to be found in this region. During 1904, however, one case showing the quartan parasite was seen in Biké district, and during the past year (1905) several unmistakable cases of the latter infection were studied in Bailundo district. The type differs in no respect that I can detect from that seen in quartan cases in other countries. The infection cannot be recognised clinically, however, for in only one case was there slight irregular fever, while three other cases in which the parasite was plentiful and regularly going on with its cycle showed no symptoms whatever. Probably native Africans who have become practically immune to the effects of *Hæmomenas præcox* are as a rule undisturbed by this feebler variety which at home sets up a very respectable fever. Out of a series of 531 natives recently examined by Mr. W. E. Fay and myself, 14 individuals showed the quartan parasite in their blood. Benign tertian has not yet been seen.

Note XXII.—Intoxicating Drinks, Drug Habits, &c., in West Africa, and their Relation to Mental Disease.

The following remarks refer only to the Angola Bantus' :—

Alcohol.—They constantly use and occasionally get very drunk on their native beverages, principally maize beer ("ochimbombo"), and a mead made of honey and water ("ochasa"). Palm toddy ("alufu") is also drunk in some districts. Of late years the Portuguese, having ignored their agreement not to introduce rum among new tribes, that beverage has become common right into the interior.

Tobacco.—Universally used, generally in the form of snuff, but not seldom smoked; it is never chewed.

Hashish (*Cannabis sativa*) is smoked by a certain per centage of the natives; more common in some districts than in others.

Kola (*Sterculia acuminata*) is extensively used in some localities north of the Coanza River, so much so that there is a superstition among the blacks and Creoles that one cannot endure the climate without it, which is expressed in a rhyming proverb which may be roughly "Englished" in this fashion—

"Who doesn't eat Kola
Can't live in Angola."

"*Okapilangau*" (*Burkea africana*).—The bark is chewed, and also occasionally inserted into the vagina by women as an aphrodisiac.

Mental disease is very rare among these people. Rum and hashish are the most deleterious stimulants used by them. I have heard the statement made that hashish smoking is a frequent cause of insanity among them. Such statements lack proof. Of the few cases of mental derangement I have examined none were hashish smokers.

Note XXIII.—A Suggestion as to the Probable Relation of Chiggers to Ainhum.

I have recently pointed out on two occasions the possibility of chiggers bearing an etiological relation to ainhum. I have long noticed that the chigger has, even in healthy feet, a predilection for the under-surface of the little toe. When the skin of this region is, as is so often the case, cut or torn, the liability to invasion is increased, for one of the first things that one notices in regard to the chigger's habits is that it enters abraded or irritated surfaces oftener than sound skin. The inevitable inflammation and cicatrisation following such invasion accounts for at least part of the symptoms belonging to ainhum. I have stated this hypothesis more in detail elsewhere in a paper from which I here quote: "The fold of skin under the proximal joint of the little toe corresponding to the edge of the web between the toes is the point where wounds are oftenest made by the sharp grasses, &c., through which the barefooted native walks and runs.

The principal reason for this in the African is that the little toe of barefooted negroes lies separate from the others at an angle due to anatomical reasons connected with flat-footedness. As I have said, chiggers are oftenest found on the under-surface of this toe, even when all the toes are intact. When wounds are once made here, however, the chiggers persistently invade them, and must be removed constantly. While I do not wish to be read as advocating *S. penetrans* as the sole cause of ainhum, it seems to me that this insect must play a part (in some instances at least) in the continued irritation which, especially in blacks (who have a fibrogenetic tendency), may lead to the contracting fibroses occasionally resulting in the spontaneous amputation known as ainhum. It may be further stated that such a theory goes far to account for the geographical distribution of the disease, which is particularly common in the two great homes of the chigger, viz., tropical America and Africa."

Note XXIV.—The Influence of Various Plants on the Habits of Mosquitoes.

On referring to my diary I find, scattered over two or three years, the following notes of experiments as to the effects of different plants on the actions of mosquitoes. In each case the test was not whether the mosquitoes would come to the plant in question, but whether the plant tested would drive the mosquitoes away when placed in one end of the cage containing them. As many substances such as wormwood, tobacco, chrysanthemum, pyrethrum, &c., when burned (and also various volatile bodies, viz., essential oils and various gases) will do this, it would not seem an unreasonable test. The mosquitoes experimented upon were principally of four species common here—*Culex hirsutipalpis*, *Heptaphlebomyia simplex*, *Myzomyia funesta*, and *Pyretophorus austeni*.

Castor-oil plants (*Ricinis communis*). No effect whatever. Both Anophelines and Culicines alight on the leaves quite as often as on banana leaves used for comparison.

Gum trees (*Eucalyptus globulus*). No effect unless the leaves are crushed, when the gnats seem to avoid them.

Pawpaw (*Papaya vulgaris*). No effect.

Sunflowers (*Helianthus sps.*). No effect.

On the other hand, large plants, when cultivated near quarters, afford shade (and even breeding places), and so actually increase the number of mosquitoes. The principal plants here which afford collections of water suitable for breeding mosquitoes are: a bamboo (*ombungu*), bananas (*ahondio*), metroxylon (*etome*) and especially two *Bromeliaceæ*, *Amomum sp.* and *Costus sp.* (*ovomoma* and *ochiteke*). Some of these are cultivated as useful or ornamental plants. I personally know nothing of the "neem," or margosa tree of India (*meliaceæ*), or of the vaunted effects of *Chenopodium vulvaria*, *Solanum nigrum*, and other similar plants, but, in view of my experience with African plants, doubt on general principles their reputed efficacy. In view of our knowledge of the mosquito's hatred of light and sunshine, the most obvious protection to a bungalow is a large surrounding open space kept free from depressions and clear of high grass.

Concluding Note.

In looking over these notes there occur to the writer other observations of interest which might have been added were the series not already so long. Some of these are: The effects of the venom of the puff adder (*Clotho arietans*), Additional Notes on the Mosquitoes of Bihé, Dental Caries among the Angola Blacks, Cutaneous Diseases, Venereal Affections and Eye Troubles in Angola, Tumours and Cancer in South-west Africa, the Climate of the Interior of Benguella, Reports on Various Collections of Entozoa, Noxious Arthropods, &c., &c. Several of these have, however, already been published in more elaborate papers and reports. The foregoing notes have served as a sort of clearing-house for some of the many scattering memoranda which collect in one's medical diary during the course of study and practice, and remain after the notes bearing on special investigations in hand have been transferred. If, therefore, I add to the observations contained in the preceding notes a list of the diseases not therein mentioned which I have reported from South Angola, the reader interested in the geographical distribution of tropical disease will be able to compare the district with other regions. These diseases are: Subtertian Malaria, Filariasis (*F. perstans*), Ankylostomiasis, Cestode Infection, *Oxyuris vermicularis*, *Trichocephalus dispar*, Bilharziasis, "Vonulo" (*Sternodynia neuralis endemica*), Leprosy, Ringworms, Prickly Heat, Leucodermia, "Craw-Craw" (severe scabies), Beri-beri, Low Fever, Heat Stroke, "Akatama" (*Neuritis peripheralis endemica*), Manioc Poisoning, Poisoning by Witch Doctors, "Onyalai" (hæmorrhagic bulla), Marginal Ulceration of the Gums, Keloids, Bites of Venomous Creatures, Milk-pox, Chicken-pox, Mumps, Epilepsy, Pneumonia, Spermatozemia, Gonorrhœa, Syphilis, Herniæ, Cancer and Tumours, Yaws, Blackwater Fever, Spirillosis ("tick fever"), Abscess of Spleen, Gundu, Ainhum, Climatic Buboes, Tropical Phagedæna, Myiasis, Multiple Nodules, &c., &c. New diseases and additional observations from this region which may be recorded from time to time will be published on some future occasion.

AN OUTLINE OF PLAGUE AS MET WITH IN BRITISH EAST AFRICA.

By James A. Haran, M.A., M.B., B.Ch.(Dublin).
Medical Officer, Mombasa, British East Africa.

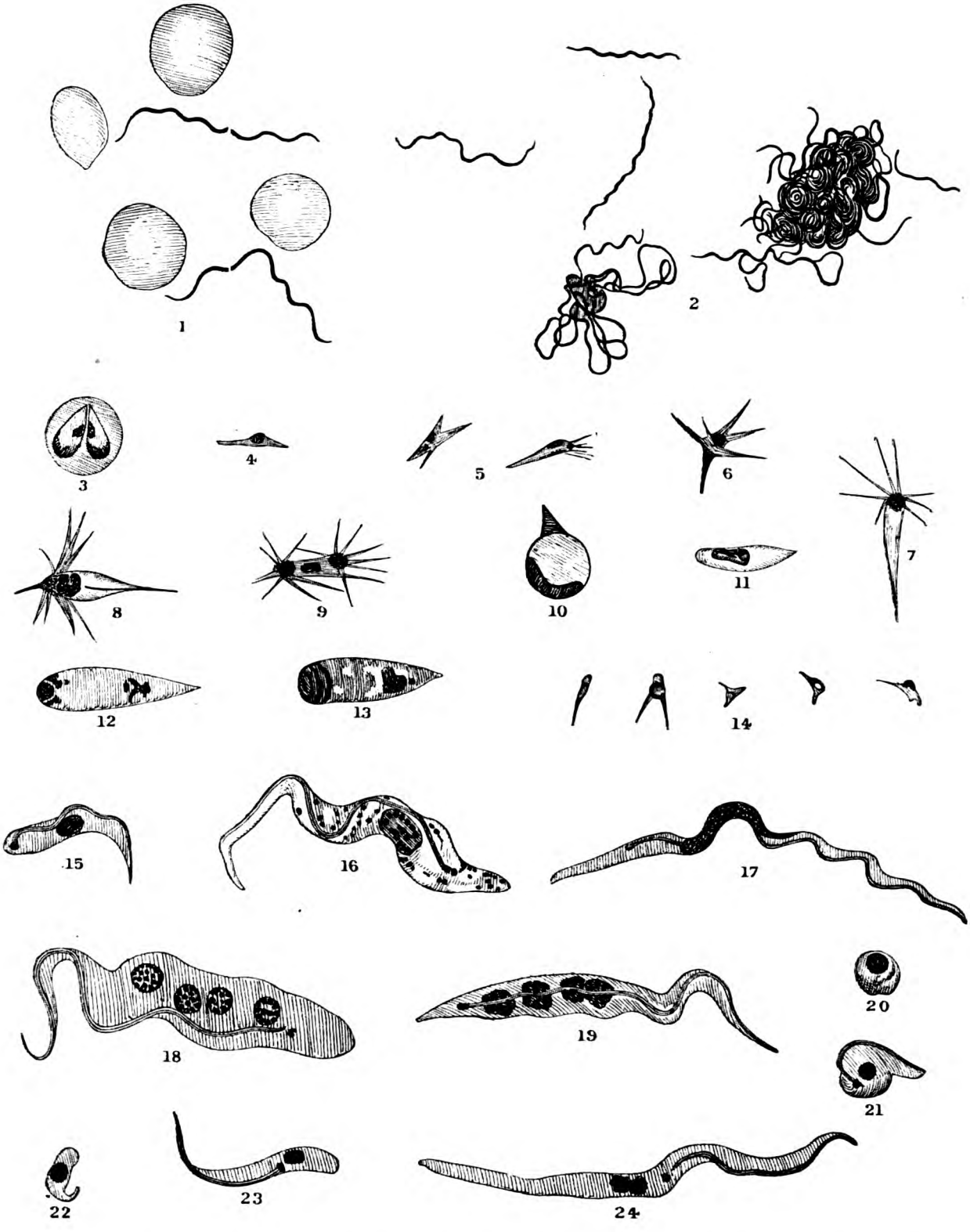
Plague is a specific infectious disease characterised by either—

(*a*) Local or general lymphatic tenderness and glandular enlargement.

(*b*) Septicæmia, associated or not with (*a*).

(*c*) Pulmonary or intestinal manifestations of a rapidly fatal character.

Previous to the establishment of European government, native tradition records two outbreaks, one among the Wateita, whose territory is about 100 miles from the coast, and the other among the section of Wakanionda dwelling on that part of the shores of the Victoria Nyanza now occupied by the terminus of the Uganda Railway. The latter people preserve a



To illustrate "Preliminary Statement on the Results of a Voyage of Investigation to East Africa." By R. Koch.

very lively remembrance of the outbreak, inasmuch as the disease dislodged them from place to place for a period of years, and was accompanied by a fatal disease affecting their cattle. The neighbouring kingdom of Uganda has been frequently visited by localised outbreaks, and is known to the natives as "Kaumpuli."

Since the establishment of the Protectorate five outbreaks have been noted, two of which were preceded and accompanied by the wholesale death of rats. Three of these took place at stations on the Nyanza, and two at Nairobi, a headquarters station 326 miles from the coast, and 5,800 feet above sea-level.

The *Bacillus pestis*, the exciting cause of the disease, is a non-motile, non-sporing, aerobic organism with rounded ends, 1·5 μ in length, stained by ordinary dyes, and decolourised by Gram. The colouration is best marked at the poles, the central area being left unstained. It is of low vitality, and easily destroyed by sunlight. The usual procedure for its demonstration is the introduction, with the usual precautions, of an exploring needle into the enlarged gland or bubo of the patient. The piston is then slightly withdrawn and the needle removed, the unstained fluid being ejected and spread on a slide. The puncture is covered with antiseptic dressing.

Leishman's is a useful and ready stain with which to treat the film. A pure culture is usually demonstrated. The sputum in the pneumonic form affords material for excellent smear preparations. In rats and cats the bacillus can be detected by means of smear preparations made from sections of the submaxillary glands and the spleen. In dead bodies smear preparations can be made from the particular organs found to be affected.

I am inclined to think that puncture by an exploratory needle of a plague bubo in a living patient is not altogether a harmless proceeding, inasmuch as it allows additional infective material to enter the blood stream, as well as injuring a gland or mass of glands engaged in opposing the entrance of infection. In doubtful and mild cases it is very useful for purposes of diagnosis.

The bacillus has been demonstrated twelve times after death. In some cases the staining reaction was not well marked, while in others a bulbous enlargement was observed at one or both poles.

The disease is usually conveyed by—

(*a*) Infected rats.

(*b*) The discharges of patients.

(*c*) Infected food.

When a community of rats is invaded by the disease those which are unaffected emigrate in a body from the area, to return at a later period. At the commencement of the outbreak in Kisumer during the present year a European who was camped some distance outside the settlement was surprised one night to find his tent invaded by swarms of rats passing through, apparently in a hurry and from the direction of the town. He had no further visits, and a few days later the first cases were discovered.

The diseased rats emerge from their burrows and stagger about in the open, passing large quantities of infective dung. It is easy to understand that individuals walking on this material with bare, abraded, and cut feet, collecting the sweepings of the floor with injured hands, or not washing their hands subsequently, and using them (as natives will) instead of a suspensory bandage, are liable to contract the disease. I happened on a case in which a Beluchi slept on the floor of an infected house with an abraded ear, and was subsequently brought into hospital with a cervical bubo. In another instance a boy was secretly ordered to sweep the floor of an infected house, with the result that he was dead the next afternoon of pneumonic plague, presumably caused by inhalation of the dust. As a native eats with the hand direct there is also danger of food contamination.

The discharges of patients are especially dangerous in the pulmonary form of the disease.

The bubonic variety does not apparently possess such grave terrors. We had one case of an Indian child with an axillary bubo, who was attended by a servant of his own caste. This latter was supposed to sleep close at hand on a rug, but I frequently caught him sleeping in the same bed. He never developed the disease. The discharge from suppurating buboes has been frequently examined, but most usually no bacilli have been demonstrated.

Clothes soiled by discharges, after exposure for some time to the sun, would seem to be harmless, if one is to credit the records of the Egyptian outbreaks of the commencement of the last century. Among them one finds it stated that the wearing apparel of the dead were hawked through the streets, and that they were subsequently worn by their buyers with impunity.

Food is liable to be contaminated by the discharges of infected rats, which are found dead or dying among bags of grain, &c., or by the dust of infected areas. Consumption of such may give rise to the bubonic form, involving the submaxillary glands, or to the intestinal form. Predisposing causes may be summed up as insanitary habits and defective houses. The barefooted and poorly fed Asiatic, who insists on excluding all possible light and air, whose ablutions are nominal, and who prefers to dig a latrine in the floor of his bedroom rather than go outside, can hardly be accused of possessing powers of resistance to disease. The structure, moreover, of his house leaves much to be desired. It usually consists of an earthen plinth, faced with mud and stone, on which is built a galvanised iron shop and dwelling place combined. Windows and ventilation are avoided, if possible. Within, as much merchandise is placed as can well be stored, his bed being almost surrounded by bales. Unless for sale purposes these are never shifted, so that a practically permanent home is afforded to the rats. Thus, on an outbreak taking place among these rodents, evidence is concealed for some time.

Clinical Course.

The incubation period varies between twelve hours and seven days. I have been unable to ascertain the presence of any signs or symptoms during that period, such being, perhaps, due to a desire for concealment on the part of the patient when brought to hospital, or to mental torpor resulting from the infection and consequent inability to answer questions coherently. The invasion is sudden and characterised

by intense headache, vomiting, sometimes diarrhœa, epistaxis, furred tongue, and a rise of temperature to between 102° and 104° F. The respirations vary between 30 to 40, the pulse between 130 to 145, being small and compressible. The gait is staggering and the voice thickened. The face is pale and characterised by an expression of fear. The conjunctivæ are injected. In the bubonic form the appearance of a bubo may be simultaneous with these signs or may follow within forty-eight hours. The commonest situation is in the femoral region. They may also be found in the axillary, post-cervical, transverse inguinal, or lumbar groups, or involving one or more of the submaxillary glands. General gland enlargement is occasionally met with. Tenderness along the course of the lymphatics is always present, as well as in the regions of apparently unenlarged glands. The bubo consists of a conglomeration of inflamed glands. It may not be larger than the terminal phalanx of the little finger and may remain so during the course of the disease. On the other hand, it may gradually enlarge and, before death, present a tumour as large as the closed fist. It is granular, hard, intensely tender on palpation, and is surrounded by a large area of infiltrated cellular tissue. Movement is avoided, as it causes exquisite pain. Incision at this stage liberates a small quantity of bloody serum which, under the microscope, shows a pure culture of the *B. pestis*. As the disease progresses the bubo usually enlarges and the general symptoms become more severe, temperature varying between 103° to 104°, respirations 40 to 60, pulse 145 to 160. The voice becomes incoherent and the patient unable to stand. The tongue is dry, brown in the centre, and red at the tip and edges. Secondary buboes appear, *e.g.*, in femoral manifestations, the iliac group, axillary, the infra-cervical. The area of periglandular infiltration increases. In the femoral region it forms a large triangle with the base resting on Poupart's ligament. In the axilla the swelling extends from the inner wall up to and above the clavicle, and may cause œdema of the arm. In involvement of the submaxillary glands the lower part of the face, on the affected side particularly, is so swollen as to render the patient almost unrecognisable. All the above changes may take place within forty-eight hours. Secondary pneumonia of fatal import sometimes appears, causing hæmoptysis, and pain and tenderness over the affected area, with fine crepitation on auscultation, the expectorated blood being full of bacilli. Between the third and sixth days in the bubonic form cases usually die. Should the patient survive and the bubo go on to suppuration, bogginess and redness appear over the infiltrated mass about the sixth day, followed by fluctuation on the eighth and twelfth day. On opening the abscess the general symptoms at once disappear, the temperature falling to between 96° and 97° F. morning and evening, the pulse below 70, and respirations 14. The tongue clears and the abscess cavity rapidly fills up. At this period a pseudo-dysentery, with tenderness over the colon, is very frequently observed, and is probably due to elimination of the toxin. During the healing of the wound the infiltration gradually lessens and the glands slowly reappear from the mass. A certain amount of thickening and gland enlargement persist up to at least three months and probably for some years.

In favourable cases not ending in suppuration, the termination of the disease is reached more slowly, subsiding masses of glands remaining tender for a long period, and liable, on slight or non-appreciable causes, to become enlarged again. Rises of temperature, associated with delirium, may accompany these manifestations. Pseudo-dysentery has been also noticed at the conclusion of these cases.

In fatal cases of *the bubonic variety* the general symptoms and signs become aggravated, the temperature falling to 100° or 101°, respirations exceeding 60, pulse uncountable. Râles are found on auscultation over the pulmonary area. Restlessness and subsultus appear. Involuntary evacution of bladder and rectum may take place. Bubonic tenderness persists to the end. With all this the patient may preserve some degree of consciousness to the end, which is caused by failure of the cardiac centre, resulting from toxæmia. One case, that of an Indian babu, was in my charge, who insisted on lighting a cheroot. I went outside for a moment, leaving him puffing with evident enjoyment. On my return within two minutes I found the man dead.

In the septicæmic variety, gland enlargement, usually general, with lymphatic tenderness, may or may not be present. The onset of the disease is sudden, the patient soon becoming delirious, with heightened colour, subconjunctival ecchymoses, and dry, brown tongue. Epistaxis appears early and sometimes continues, at intervals, during the course of the disease. Jaundice, with involuntary action of the bladder and rectum, quickly ensues. The spleen is enlarged and tender. Coma follows, and a fatal termination may be expected within three days of the onset of the disease. In this form of plague the pulse and respiration are even more rapid than in the preceding. The temperature runs the same course.

I have seen but one case of the *intestinal variety* It was that of a man resident in a quarantine camp with others for purposes of observation. They had been removed from some houses in which plague had broken out. The patient in question was suddenly taken ill about midnight with abdominal pain, vomiting, diarrhœa with hæmorrhage, and collapse. Constant evacuation continued during the night, but ceased with the advent of morning. Patient's temperature was 101° in the mouth, pulse 150, and respirations shallow and rapid, cutis anserina, and the tongue dry, furred and shrunken. A patch of bronchial breathing, with associated dulness and tenderness, appeared in the right apex and was accompanied by hæmoptysis. Patient died at one in the afternoon, the entire manifestation having lasted about thirteen hours.

The *pneumonic form* is the most fatal to the patient and dangerous to the attendants. In a case which came under observation the boy, an African, had been secretly engaged on the previous day to sweep out a house in the infected bazaar, which had been temporarily evacuated. The next morning the boy was awakened at four o'clock by a severe pain over the sternum and hypochondria, associated with dyspnœa. On being brought to hospital he could not

stand. He was lethargic, the voice was thickened and verging on incoherence, conjunctivæ suffused, temperature 103°, pulse 140, and respirations 60. On examination dry crepitations were found on auscultation over the bases of both lungs, with diminished resonance. Cough and expectoration were absent, as well as gland enlargement and tenderness. Two hours later the patient had passed into a state of torpor, the tongue being dry, black and shrunken, and lying in the bottom of the mouth. Bladder and rectum were acting involuntarily. Respiration was extremely rapid and shallow, and the pulse scarcely perceptible. He died at 1 p.m., the disease having run its course within nine hours. Infection in this case was due to inhalation of the dust.

Post-mortem appearances are: marked rigor mortis in association with well-marked putrefactive signs, submucous, subserous, or cavity hæmorrhages. Effusion into the various cavities, congestion or consolidation of pulmonary areas, pial congestion, enlarged spleen, tissue staining in the neighbourhood of vessels, enlarged masses of agglomerate glands, purple on section, the surrounding tissues being engorged with hæmorrhagic fluid. Intestinal congestion, the lumen being occupied by blood-stained fluid or actual blood casts. Heart chambers may be occupied by unformed clot.

Treatment should be of a stimulating character from the commencement. The early administration of brandy in frequent doses is often attended with good results. Digitalis and strychnine are also useful. The hypodermic infection of Yersin's serum is of the highest value. In the bubonic forms, belladonna and glycerine fomentations, or linseed meal applied locally, relieve the pain. I have seen improvement following on the hypodermic administration of morphia and strychnine. When fluctuation is palpable the pus should be liberated by free opening. Incision prior to the advent of suppuration is harmful. After evacuation daily dressing with pieces of cotton-wool saturated in 1-1,000 hydrarg. perchlor., may be applied and fixed by a bandage soaked in the same solution. I have never found drainage necessary. The cavity fills up quickly. Fluid diet is given in the earlier stages; solid diet may be resumed as soon as the bubo has been opened, should it suppurate, otherwise the special circumstances of each case have to be studied. I have seen patients given solid diet through the entire course of the disease. In the intestinal form stimulants and astringents should be administered vigorously, very little time, however, is available. It is possible that Yersin's serum in large doses would be of advantage, but the great exhaustion which quickly follows the onset of the disease should not be forgotten.

The pneumonic form is practically hopeless as regards treatment. Stimulants and Yersin's serum may be administered freely. The septicæmic variety may be treated on similar lines. Isolation is essential in the septicæmic, intestinal and pneumonic forms, more especially in the last. The medical attendant should make his examination in the open air, if possible. Should the patient be expectorating aimlessly in every direction, the wearing of some form of face protection is to be recommended. In its absence I should be disposed to cover the patient's face with a towel, which might subsequently be boiled. A drawback to such procedure may be the possible irritation on the patient's part. In such eventuality a lot may be taken for granted. When it is considered that the subjects of suppurating buboes (which result from a mixed infection) frequently recover, should they survive the earlier days of the disease, it might be useful were experiments made in the administration of measured doses of toxin, derived from pyogenic cocci, to animals inoculated with plague. There would seem to be an antagonism between the former and the *B. pestis*.

Prophylaxis.

Cleanliness, light and air, rat-proof houses, and the destruction of these rodents, are essential. An outbreak of plague rarely reaches large proportions, unless the rats are involved. Experiments are in progress with a view to obtaining a germ capable of causing their wholesale destruction. The Danysz bacillus has been successful with mice, and it is to be hoped will prove equally so with rats. When a case occurs in a house the patient should be removed to hospital and the other residents placed in an isolated building or camp under observation. Persons wearing boots should then enter the house and first lay the dust by freely sprinkling the floor with a solution of Jeyes' crude carbolic or other antiseptic. The goods and furniture are then taken out and placed in the sun, all rubbish or uncleanly material being destroyed or disinfected. Additional windows may be made, if thought necessary, and they, together with all doors, should be left open. The walls are then covered with limewash, and the floors sprinkled freely with lime, or saturated with strong carbolic or corrosive sublimate solution. Haffkine's prophylactic may be administered to those isolated for observation. This is usually injected in varying doses and with antiseptic precautions into the outer side of the arm. Within twelve hours reaction occurs, accompanied by rise of temperature, and pain, tenderness and enlargement of the corresponding axillary glands. The temperature quickly subsides, but the gland phenomena persist for about a fortnight.

Inoculation gives rise at first to an increased susceptibility to infection, followed in a week or so by an immunity, which persists for a fortnight or three weeks. The advantage of the measure is that it replaces to a certain extent the more cumbrous practice of quarantine. Despite the above, plague may persist, the rats continuing to die. When these are involved the length and extent of an outbreak probably depend on the time the disease takes to work through the affected rat community and the extent of country over which that community ramifies. When cleanliness and general precautions have failed we have caused the evacuation of the infected area, placing the inhabitants in tents. This is a costly proceeding and only possible in small settlements. Were one certain of the guard and the weather, it might suffice to sleep in the streets, leaving all doors and windows of the houses open. This remark, of course, applies to tropical countries.

In endemic areas it is possible that the disease constantly exists among the rats in a very mild form, and that increase in their numbers or aggregation in

human habitations causes an aggravation of the type and consequent communicability. It might be of interest to hold enquiry into all lymphatic manifestations occurring among the inhabitants of an endemic area, as it may not be impossible that the disease is constantly present in a mild form and passes unobserved.

AN OUTBREAK OF ACUTE CONTAGIOUS CONJUNCTIVITIS IN CEYLON.

By Sir Allen Perry, M.D., D.P.H.,
Principal Civil Medical Officer; and
Aldo Castellani, M.D.

In March of last year our attention was drawn to several cases of the above disease which occurred in the city of Colombo, and our thanks are due to Dr. W. H. de Silva, the Ophthalmic Surgeon of the General Hospital, for his courtesy in placing at our disposal the clinical material for the preparation of this paper.

In our experience such an outbreak had not been seen previously, and we have the authority of Ceylon practitioners of longer experience of eye diseases in the island than ourselves, who state they do not remember a similar occurrence.

The first cases were thought to be examples of gonorrhœal conjunctivitis until a bacteriological examination of the secretion demonstrated the error. As a noticeable characteristic the outbreak was limited practically to the well-to-do classes, there were more Europeans attacked than those of any other race, and it was almost unknown among the poor. The onset of the disease was sudden, with early symptoms of an alarming nature, and its course was rapid. It yielded readily to treatment, and serious complications were rare.

During the prevalence of the north-east monsoon in the early months of the year the meteorological conditions over the western part of Ceylon are high temperature, low humidity, a long spell of drought, and uninterrupted brilliant sunshine. These conditions seem to favour the development of a small fly, one of the family *Muscidæ*, popularly known as the "eye fly," from its habit of always trying to settle on that organ.

At this season of the year the surface of the roads is pulverised by the traffic into an irritating red dust, which is blown about by the wind in clouds, and it is usual to come across many cases of simple catarrhal conjunctivitis in all classes, particularly among the prisoners in the gaols. The cause of this affection is commonly attributed to the dissemination of infective particles by one or other, or by both, of the above-mentioned effects of the meteorological state. No history of the introduction of acute contagious conjunctivitis could be traced, but the probability of this is great, considering the large number of ships that arrive at the port daily, bringing foreigners from all parts of the world. The symptoms of this outbreak were an acute onset with great swelling and discolouration of the eyelids, an early watery discharge becoming muco-purulent and in some cases purulent, swelling of the conjunctiva, especially of its ocular portion, with subconjunctival hæmorrhages (the hæmorrhagic catarrhal conjunctivitis of Nettleship), and photophobia with pain of a burning character.

The cases were extremely infectious, more than one member of the same family being attacked.

In many instances both eyes were affected. We consider the incubation period was from twenty-four to forty-eight hours.

The ages of the patients ranged from two years to forty years, the greater number were in children and young adults. An attack lasted about three weeks, and as a rule there were no complications. Haziness of the cornea occurred in a few cases, and in only one of them was there any permanent corneal damage. This case is so interesting that we give it some detail.

The patient, a planter's daughter, 2½ years of age, living in a remote part of the country, had been suffering from the affection in both eyes for about a week before she came to Colombo. When seen by us she had great swelling of the lids, blepharospasm, a purulent discharge, and an ulcer on the lower segment of each cornea, with a bound-down pupil on the left side. In the experience of one of us the destruction of corneal tissue in cases of gonorrhœal conjunctivitis generally occurs in the lower segment of the cornea; the reason for this determination of site is the extra pressure there, produced by the overlapping of the upper lid; these conditions were present in this particular instance.

The ulcer on the right side and the general condition of that eye yielded rapidly to treatment, but the corneal complication of the left eye increased in depth and area, notwithstanding the application of pure carbolic acid and subsequently the actual cautery. After some days the destructive process stopped and the ulcer was seen to be filled by a yellowish-grey membrane, the surface of which was glistening and level with the rest of the cornea. This membrane was easily peeled off, leaving a clean, ragged bed; a fresh layer formed within twenty-four hours after each time it was removed. The membrane was examined by one of us for the Klebs-Loeffler bacillus with a negative result. This pseudo-membrane may have been the result of the caustics, or more likely it was an instance of the development of an exudation which is said by Weeks to happen in 4 per cent. of cases of acute contagious conjunctivitis. The formation of the pseudo-membrane continued for about a month and the child made a fair recovery, but with a scar which is likely to be permanent.

Bacteriological Examination of the Cases.—We have examined microscopically and bacteriologically the secretion from six patients.

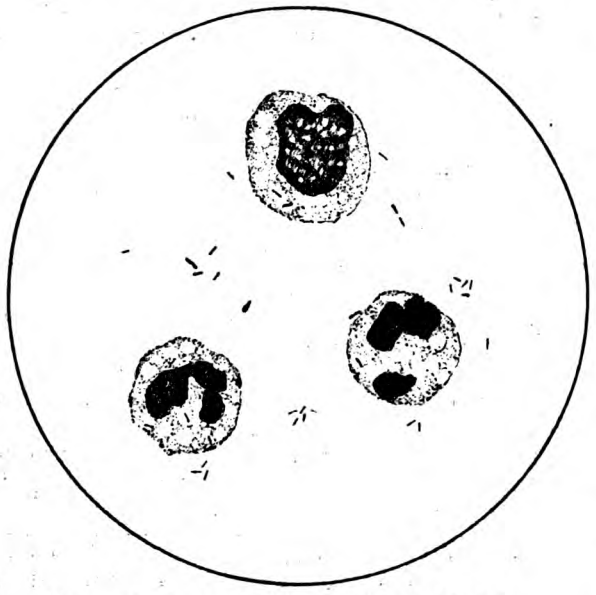
Fresh and stained preparations were made. The discharge consisted of numerous leucocytes, most of which were polymorphonuclear; some fibrinous threads and a few squamous epithelial cells; occasionally some erythrocytes could be seen. In fresh preparations, using a high power and a very small diaphragm, some short, slender non-motile rods could be detected.

Films stained with the usual aniline dyes showed fairly numerous bacilli. The stain which brought them

out best was diluted carbol-fuchsin (1 in 20), which was allowed to act for ten minutes. These bacilli appeared as short, thin, straight rods, evenly stained throughout their length, which varied from one to two microns; no capsule was present.

The organisms were often grouped together irregularly; in rare instances some were arranged in short chains. Many were contained in the protoplasm of the leucocytes.

The bacilli were decolourised by Gram's method. These morphological characters suggested to us at once the probability of our being in the presence of the Koch-Weeks bacillus, which proved to be the case by



Preparation stained with diluted carbol-fuchsin.

the results of the cultural investigation. We employed the ordinary laboratory media, as well as blood agar prepared by smearing on the surface of the agar tubes some drops of blood taken aseptically from the finger; the media were inoculated with the purulent discharge under aseptic precautions. In the first case examined all media, including those containing blood, remained sterile, with the exception of one agar tube, which showed three or four colonies of the *Micrococcus pyogenes albus*.

In the remaining five cases the blood agar medium, kept at a temperature of 35° C., showed after thirty to forty-eight hours some growth; and of the other media some remained sterile, while others showed a few colonies of staphylococci. The blood agar tubes presented small, roundish, translucent, *dew-like* colonies, with very little tendency to become larger or confluent. Preparations from these showed small non-motile bacilli well stained by diluted carbol-fuchsin and not stained by Gram's method. We succeeded in obtaining subcultures from these colonies on blood agar, while we always failed with the ordinary media. The organism showed a great tendency to die out rapidly.

The morphological and cultural characters described clearly show that the germ isolated by us was the typical Koch-Weeks bacillus (*Bacterium ægyptiacum*, Lehmann and Newman). We must add that in one case (Case No. VI) we found associated with it a bacillus of the xerosis group. On the blood agar tubes in this case, besides the typical colonies of the Koch-Weeks bacillus, there were larger, opaque, granular colonies easily distinguishable. Preparations from these colonies showed bacilli which were well stained by Gram's method. To this association of the xerosis bacillus with the Koch-Weeks, we are not inclined to place much importance, as it is well known that the xerosis bacillus can be found very frequently in any inflammation of the conjunctiva.

Pathogenicity of the Koch-Weeks bacillus isolated in Ceylon.—We have made several attempts to infect animals. We give here a few examples of our experiments.

Experiment 1. *Monkey.*—Into the conjunctival sac of the left eye were instilled three drops of the purulent discharge containing many Koch-Weeks bacilli collected from Case No. IV. Result: *Nil*; not even the slightest hyperæmia was noted.

Experiment 2. *Monkey.*—In the conjunctival sac of the right eye an emulsion of two loopfuls of a blood agar culture of the Koch-Weeks bacillus was instilled drop by drop. Result: *Nil.*

Experiment 3. *Monkey.*—The conjunctiva of each eye was scarified by means of a sterilised pin. In the left conjunctival sac an emulsion in broth of one loopful of a blood agar culture was instilled. Result: Marked hyperæmia; the same degree of hyperæmia, however, was present in the other eye, where the scarification was not followed by the inoculation of the organism. In the inoculated eye the germ could be recovered during the first five hours, afterwards it disappeared completely.

Experiment 4.—The discharge taken directly from the patients' eyes, and in other cases emulsions of cultures, were injected into the conjunctivæ of several rabbits, guinea-pigs, and white mice. Result: *Nil.*

Experiment 5.—To study the virulence of the strains of the Koch-Weeks bacillus isolated by us, several guinea-pigs and rabbits were injected subcutaneously and into the peritoneum. All the animals survived without showing any signs of malaise. These researches on the pathogenicity of the Koch-Weeks bacillus found in Ceylon, gave the same results as have been arrived at in other countries, viz., that the germ is practically non-pathogenic for the lower animals.

"Clinical Studies," November 1, 1905.

Splenic Anæmia.

Bramwell, B., treated a case of splenomegaly with ferri carb., grs. v. thrice daily, and exposure of the splenic area once daily to X-rays. The spleen slightly diminished in size and the red blood count improved. In another case, boric acid in 20 grain doses in conjunction with quinine hydrobromate, grs. v., and tinct. ferri perchlor., min. x., allayed the febrile symptoms, and improved the general condition, but did not diminish the spleen. The temperature seems to have fallen in consequence of the exhibition of boric acid.

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THE

Journal of Tropical Medicine

FEBRUARY 1, 1906.

THE DEPRECIATION OF THE ATTRACTION OF THE INDIAN MEDICAL SERVICE AND ITS REMEDIES.

I.

No body of medical men have done more to advance our knowledge of tropical maladies than the officers of this ancient and honourable service, and its welfare is therefore of great public importance. In the early days contributions by practitioners in the Tropics to medical literature were evidently regarded by their brethren at home almost in the light of travellers' tales, or at any rate of no more than a curious interest to the general body of the profession. The establishment of tropical medicine as a distinct branch of the healing art may, indeed, be said to date from the establishment of a chair on the subject at Netley, to which a retired Indian medical officer, the late Professor Maclean, was appointed. Maclean was a man of exceptional ability, as well as a born lecture-room orator, and his lectures and valuable systematic work on the subject soon elevated tropical medicine to a recognised position in the medical commonwealth. He taught, amongst other forecastings of modern opinion, the value of the mosquito net in the prevention of malaria and the communicability of cholera through the agency of water; though it must be confessed that it never seems to have occurred to him that the efficacy of the mosquito net might be due to its efficiency in excluding mosquitoes.

From the therapeutic side, however, his book may to this day be consulted with the greatest advantage, and it is a pity that no new edition has been prepared, as this side of the question has been a good deal neglected in the more modern works on the subject. About the early eighties the service seemed to be neglecting to maintain its reputation, though the work of Carter, of Bombay, on spirillum belongs to this period.

The burning question of the day was, however, the etiology of cholera, and the conflicting interests of the time led to unbiassed research being placed beneath the cold shadow of official disapproval. The Indian Government quite rightly regarded quarantine as useless, but unfortunately fell into the error of believing that its adoption depended, not on the question of its efficiency and expediency, but on that of the communicability or otherwise of the disease. When keen and scientific officers recorded facts tending to prove communicability they were accused of "theorising," and deliberately ordered to delete the facts from their official reports, so that a reputation for a weakness for research was about the worst a man could earn who desired to succeed in the service. The visit of Koch to India, however, tumbled the whole flimsy edifice based on the *supressio veri* about the ears of its authors, and what is more, demonstrated the inapplicability of quarantine; but the men who would have worked had packed away their microscopes in disgust, and it was some years before this blow to efficiency could be recovered from. The Indian Government had not, however, learned its lesson. It formally punished King, of Madras, for invaluable original work on the vaccine virus, and when Ross made his great discovery it first obstructed his work, and then, after according some tardy and grudging support, made no efforts whatever to retain the services of the brilliant investigator it found to its hand within the ranks of its own servants. Was there ever a better case for selective promotion?

There are signs, indeed, that matters are improving in regard to the promotion of research, but the man who should have been the honoured and rewarded head of that department has been lost to India to Liverpool's gain. To this day,

however, the best advice that can be given to the would-be recruit for the I.M.S. is as follows: Qualify at as early an age as possible. Do not waste time by taking up a resident medical appointment in your hospital, or in acquiring such useless lumber as an honour, degree, or a qualification in public health, but go up for the first examination that occurs.

As the keenness of the competition has a good deal diminished you will probably get in somehow; and your position on the list will have so little influence on your future career that six months seniority on the list will avail you far more than the kudos of being highly placed in the competition. The truth of this will be especially apparent towards the end of your period of service. Only the other day thirteen excellent officers were "passed over" for promotion simply because they were too old. There was no other reason; for the thirteen included men holding most distinguished records, and who, moreover, were known to be *personæ gratæ* with the authorities, who really had no choice in the matter.

Once in the service stick to routine work, preferably on the military side, as the civil branch no longer presents any particular pecuniary advantages, and you will have light, pleasant work, and serve in the pleasantest stations.

Above all, avoid all suspicion of originality or special ability in any particular direction, as it may lead to your being placed on "special duty," and when you return to the ordinary line of work you will find yourself penalised, as if employment of the sort were an indictable offence.

No one who knows the service will deny the soundness of the above advice, and it further cannot be denied that the fact of the expediency of such counsel reveals a state of things that urgently calls for reform.

For the routine work of the service, good, average men whose professional experience outside the lecture-room is strictly limited to India will always be available in sufficient numbers; but the Indian service includes so many appointments for which such humdrum credentials are entirely inadequate that every effort should be made to attract men of matured study and exceptional qualifications.

With this object the following reforms are respectfully suggested to the "powers that be":—

(1) The present age limits are absurd under modern conditions of medical education. Practically speaking, it is impossible for the ordinary student to qualify under two or three and twenty, and a man who completes his education by taking a resident medical officership and an honours degree cannot possibly enter till he is twenty-five or twenty-six, under which circumstances it is quite impossible for him to reach the highest ranks of the service.

The age limit should be absolutely done away with, and in its place a term of service substituted, say thirty-five years in the case of promotion to colonel, and thirty-seven in the case of surgeons-general.

To judge mankind by its years is a rule-of-thumb absurdity.

There are plenty of veterans of sixty who can hold their own even in practical field sports; and if men far in advance of this limit be physically and mentally fit to act as Cabinet Ministers they may surely be trusted to cope with the far lighter strain of the efficient conduct of the duties of director-general of a medical service. A man prematurely senile would presumably not be selected for promotion to so important a post; and if physically unfit, the ordinary mechanism of invaliding, which is applied to officers of all grades, may be trusted to deal with the difficulty.

(2) Every effort should be made to attract men of the highest qualifications.

It will not be enough to allow time spent as resident medical officer of a teaching hospital to count for service and pension. In addition, a monetary bonus should be given to successful candidates who have sacrificed immediate pecuniary returns to the desire for professional efficiency. The same arguments apply to the holders of honours degrees; that is to say, those that require more prolonged study than is exacted for bare qualification; the F.R.C.S. and the holder of a qualification in public health for example. To those who have gained such degrees a small extra allowance should be made.

Engineering firms find that they cannot obtain a fitter for the same wages as a rivetter, and to offer the same rate of pay that is given to bare qualification to the finest flower of the medical schools is to put into practice the ideals of the worst school of trades unionists who would reduce all workmen, bad, good, and indifferent, to the same dead level of remuneration.

In the sister service of the R.A.M.C. the expediency and justice of rewarding men for the labour involved in acquiring additional professional knowledge has been recognised by the grant of what is known as specialist pay. We consider, however, that while the principle of rewarding exceptional zeal and ability is entirely sound, this particular application is a mistake.

It is an abuse of the ordinary application of the word to dub as a specialist a young fellow who has merely passed a few months in the clinic of some special hospital; for men cannot be converted into specialists in the same way as the pork butcher turns out an Oxford or a Bologna sausage by stuffing a skin with varying kinds of meat.

True specialism can only be attained by those who have laboured to give themselves an exceptional general training, and have then devoted special study and observation to a particular class of cases; and the best evidence of fitness to be-

come a specialist is the possession of an honours degree.

At any rate, the plan is entirely inapplicable to a service in which a large percentage of officers have, for example, far better claims to call themselves eye specialists than the majority of London ophthalmic surgeons, numbering their successful operations by hundreds when the latter can boast only of tens. Just fancy the position of the young officer who presented himself before the university professor in charge of the Eden Hospital, Calcutta, as an obstetric specialist.

The system would be killed by ridicule; but no such objection could be raised to a special allowance to the holders of honours degrees, as all are well aware of the time and labour involved in their acquirement, and there can be no doubt that it would enormously stimulate post-graduate study within the ranks of the service.

THE HYGIENE OF TRAVEL IN TROPICAL AFRICA.

Professor Koch's valuable communication, a full translation of which appears in our columns, is naturally mainly occupied with etiological questions, but contains one very obvious prophylactic recommendation with respect to tick fever. This is to the effect that officers travelling should seek out fresh ground at halting places on which to pitch their tents. The proposal is a very proper and natural one, though it indicates a certain amount of unfamiliarity with the difficulties of tropical travel; for there are undoubtedly an enormous number of situations where, owing to the closeness of the jungle or the difficulty of obtaining supplies, it would be absolutely impossible to carry it into effect.

When a possession has passed beyond the stage of exploration, and has entered that of occupation and administration, officers must needs be continually passing to and fro, and it is clear that any such procedure is absolutely out of the question; and that to avoid interference with private rights, special camping grounds must necessarily be adopted even in fairly open country. Under such circumstances, Koch's recommendation becomes a mere counsel of perfection. What should be done is that at all habitual halting places, a sufficient space for the tents of one or two European officers should be fenced in, and if possible macadamised. Moreover, as quite apart from humanitarian considerations, it is most inconvenient and fatal to service efficiency that native subordinates and followers should become infected; a considerably larger space should be similarly hardened for their accommodation when bivouacking for the night.

The ticks harbour in dust, and are not so constituted as to be able to burrow into a hard surface, so that by insisting on such a ready prepared surface being swept, a very fairly efficient degree of protection would be afforded.

What, however, would Koch have said had he been dealing with the ordinary travelling customs in vogue in most parts of British Tropical Africa where our officers are unable to carry tents at all, owing to the insufficiency of the amount of transport allowed to them; and where our Colonial Governments actually countenance the unfortunate natives being turned out of their huts to afford their undesired visitors the necessary shelter for the night? Talk of Chinese slavery! here, indeed, is a splendid opportunity for an election cry utterly wasted.

The procedure is, of course, justified on grounds of economy, but is surely indefensible and impolitic from an administrative point of view; and the risks to which it exposes our officers are so great and obvious from our present standpoint of knowledge that it is marvellous that such a system should continue to be tolerated for a single day. To be bitten by infected ticks is, of course, only one of the dangers to which those who are forced to adopt such a repulsive shelter are exposed, as native huts necessarily swarm with malarial mosquitoes, and half a dozen other sorts of parasites of a more or less objectionable character. An order should be promptly issued that officers should under no circumstances sleep in native huts when marching, and proper tents and transport should be provided for them so as to obviate all necessity of resort to so terribly risky a procedure.

THE DEATH OF DR. STEWART.

The murder, under circumstances of peculiar atrocity, of Dr. Stewart, of the Nigerian Medical Service, is an event that cannot fail to impress the stay-at-home Englishman of the smallness of his knowledge of the conditions of life in an African colony.

To a scientific man, the contingency of being eaten afterwards, is one that adds little or nothing to the horrors of a violent death, beyond perhaps inspiring a grim hope that one may "disagree" with the digestive economy of one's murderers; but that an officer should be actually killed and eaten, not only well within the boundaries of a British colony, but no more than thirty or forty miles from its capital, gives rise to reflections that should give pause to those authorities at home who, though absolutely without local knowledge, have yet the last word as to the administration of these distant colonies. It is true that Nigeria has only come under British rule quite recently, but as a matter of fact, this debased appetite is a common characteristic of most of the tribes of Western and Central Africa; and though fear of consequences would, in the case of a

white man, render such an event extremely unlikely in the neighbourhood of Cape Coast Castle or Sierra Leone, few who know the country would care to deny that cannibalistic tastes are still prevalent, or that, amongst themselves, when safe from the eye of the ruling race, such occurrences are either impossible or even uncommon.

Evidences of cannibalism have been found even in Europe, though it is doubtful if these ancient cannibals were really Caucasians, and with this doubtful exception the Caucasian and Mongolian races have always regarded cannibalism with the horror that should be natural to any race that aspires to survive in the struggle of fitness. At any rate, if ever given to such practices, the white and yellow races abandoned them in the very earliest stages of the evolution of their civilisation, whereas the negro retains them long after emerging from the stone age, and even when he has made considerable advances in agriculture and in the arts of weaving and working in metals.

So inbred, indeed is this savagery, that even after generations of nominal Christianity in the West Indies, the rising in Jamaica, which wrecked the reputation of the much maligned Governor Eyre, was marked by such incidents as the scooping out of the brains of their European victims and the conversion of skulls into drinking cups. The irony of the situation, however, lies in the fact that under our system of administration it is quite possible that the very men who "chopped" poor Dr. Stewart may give trouble to his immediate successors, in the less congenial but more humorous guise of an obstructive village sanitary committee, or some such exotic organisation, based on the latest European models. Surely such an incident shows, *inter alia*, that at any rate in a matter as foreign to his philosophy as sanitation, it is essential that the negro should be ruled benevolently but despotically by the European.

BISKRA AS A HEALTH RESORT.

Biskra, the desert city, is an agglomeration of oases to the south of the Aurès Mountains which has become a very popular resort during the last few years. It is only 360 feet above sea-level and the climate is delightful for six months in the year. The temperature in the shade averages 60° F. during the winter season (November to May), and rain is practically unknown, the total annual fall not exceeding an inch and a half.

Within the sphere of influence of the carefully husbanded water supply the soil is remarkably fertile and vegetation is exuberant. The oasis of Biskra alone contains a hundred thousand date palms, besides other fruit-bearing trees, and this luxuriance of growth is in startling contrast with the surrounding aridity. There are plenty of objects of interest in Biskra and its immediate neighbourhood. The town, with its 8,000 inhabitants, is a typical example of "life in an oasis."

Abstract.

Flies and Cholera (Mouches et Choléra). By Dr. A. Chantèmesse and Dr. F. Borel. 1 vol. in 16. Price 1s. 6d. J. B. Baillière et Fils, Paris, 1906.

Cholera which started from India in 1900, had arrived gradually in the vicinity of Berlin in October, 1905. Has it reached the final limit of its onward march? It would be rash to state so. During the four preceding years cholera has apparently disappeared at the onset of the cold season, but has always resumed its progress in the early days of the following summer. We must therefore be prepared for a fresh extension of this epidemic which hitherto has been uncontrolled, in the first fine days of 1906.

Truly we may face this alternative without much fear, the progress of hygiene having provided us with arms of ever increasing efficiency for combating this scourge. Nevertheless, we have not as yet reached the time when it can no longer be feared. As yet we can only restrict the number of cases; it is difficult, on the other hand, to entirely prevent a manifestation of contagion, and the brutal fact of a contamination may at any time occur.

Drs. Chantemesse and Borel have therefore deemed it of interest to draw up in this small volume a schedule of the latest ideas on cholera collected by science since the last epidemic. Amongst these, there are at least two which appear to us to be specially worthy of notice, as a knowledge of them is of a nature to invite some important modifications in the prophylaxis of cholera. These are *latent microbism* and the *dissemination of the diseases of microbic origin by the intermediate agency of insects.*

A historical review of the several incursions of Indian cholera into Europe between 1817 and 1892 leads the author to the following conclusions. India is the original home of cholera, from which it spreads and reaches Europe by three different routes. The first is through Afghanistan and Persia; the second is by way of the Persian Gulf, Chat-el-Arab, and Persia; the third is that by Mecca and Egypt to the Mediterranean Sea. The progress of the various epidemics has been notably influenced by the amplification of the means of transport and by their ever-increasing ratio of speed. Thus in 1823 cholera did not go beyond the South of Russia. In 1830 and 1848 it took two years to invade the whole of Europe; whilst in 1892 this continent was completely affected in a few months.

Towards the end of 1899 and early in 1900 cholera in India again broke out with great severity both at Bombay and Calcutta; it then proceeded to the south of the peninsula, and thence gradually extended eastward to China and westward to Europe.

On the eastern route it attacked the Dutch Indies in June, 1901, and then in succession appeared in Singapore, Burmah, the Philippine Islands, China, Formosa, Japan, and Cochin China, and with deadly force afterwards in Manchuria and Corea, finally only ceasing its advance to the north on arrival at the end of the inhabited world.

To the west of India three routes lay open, all of

them equally familiar with this scourge. The land route through Afghanistan, the sea route *via* the Persian Gulf, and that through the Red Sea. Which of these three roads would it follow? Briefly stated, cholera, leaving India in December, 1901, reached Hedjaz in March, 1902, contaminated Egypt in July of the same year, and following the Mediterranean coast appeared in Damascus in January, 1903. After reaching Bagdad early in 1904 it passed on and ravaged Persia, and by July had attacked Bakoum on the borders of the Caspian Sea; from here it invaded on one side the Caucasus and on the other the Volga, which it ascended as far as Saratow, from whence it spread through Russia, finally appearing in August, 1905, in Eastern Prussia and in Austria.

In order to arrest the onward march of cholera, and especially if logical barriers are to be opposed to it, this march must be considered under the three following different aspects: its transportation, propagation, and dissemination.

Transportation is its extension from a contaminated country to a distant healthy region; *propagation* is its extension from town to town, or village to village, in a recently infected territory; and lastly, *dissemination* consists of the various methods of which the epidemic avails itself to spread in the same town from house to house, or from one individual to another.

Cholera can be *transported* to a distance only by healthy individuals, in whose intestines specific cholera vibrios may be found, although they themselves show no clinical symptoms of the disease.

Cholera may be *propagated* by the agency of individuals in a state of latent microbism, but also by clothing, &c., infected with choleraic dejecta, within five days, and by individuals in whom cholera is incubating.

Cholera may be *disseminated* in five different ways:—

(1) and (2) By linen and personal effects, if recently soiled by cholera dejecta.

(3) By drinking water, if the contamination can reach the wells, cisterns, or ground water.

(4) The actual patients will infect their surroundings by their dejecta, which represent pure cultures of the dangerous microbe.

(5) Healthy individuals may become a source of contagion for others, as their fæces in many instances will contain the cholera vibrio, which, although not active in their case, may yet become pathogenic for others.

Modern science now entitles us to say:—

In times of cholera, the dejecta of many people are receptacles of cholera vibrios; everything contaminated by these dejecta becomes in its turn a source of danger, so long as desiccation, disinfection, or spontaneous alteration have not destroyed its activity. The multiplication of the cholera microbe takes place in the digestive canal to the exclusion of other parts of the body, but not necessarily manifesting its presence there by any pathological trouble.

The prophylaxis applicable to cholera is, therefore, at once both restricted and yet amplified; it is restricted, since we know that all that is required is to destroy only the fresh dejecta wherever they may be found; it is extended, since we now know that all dejecta must be attacked, not only in the case of patients, but also those of men apparently in good health.

Now how does the cholera vibrio usually pass from these dejecta into the digestive tracts of individuals living in an infected area? Is it by drinking water? Not necessarily. By inhaling dust? No. Judging by the analogous cases of plague and yellow fever (which are also lessened in number, but not in intensity, during winter), may we not conclude that a similar effect, whilst not affecting the cholera vibrio itself, may, nevertheless, act on the intermediate agent which carries the germ and permits it to penetrate—if not indeed directly, at least indirectly—into the human stomach? Without mentioning the numerous insects which—especially in hot countries—might act this part, can we not find one, in Europe as elsewhere, answering in all points to the description of the intermediary required? We allude to the ubiquitous fly.

Natural history shows that a fly can transport cholera germs in two ways, either as an inert carrier (owing to the vibrios adhering to its feet or any other part of its body, and then being deposited on food), or by means of its proboscis, which retains and preserves the germs and redistributes them successively over different media, which, if favourable for their development, ensures their multiplication, especially if the temperature is also sufficiently high for this purpose. Several series of experiments prove that flies can disseminate cholera, but that this contamination disappears in about twenty-four hours after contact with the source of choleraic infection. We do not assign to flies an exclusive *role* of disseminating agents of cholera, for other modes have also a certain value. For instance, recently soiled linen may be touched by the hand, which may then touch one's mouth or food, and cholera thus be contracted. Water may become infected by infiltration with fæcal matter, and thus become the cause of part of the epidemic. We only here insist on a new method of dissemination which, conjointly with others, permits us to explain more completely the progress of cholera.

The prophylaxis against cholera is divided into several headings: *International*, *National*, *Urban*, and *Individual*.

International prophylaxis against cholera will probably remain an open question for very many years to come.

National prophylaxis can only play a restricted part in the defence against cholera; it can forbid entry on its territory of patients or of freshly soiled linen, but it is practically powerless against individuals in a state of incubation or of latent microbism, and it must delegate the ulterior and rigorous duty of keeping them under observation to the respective municipalities. *It is, therefore, to urban and individual prophylaxis that we must look to for successful protection against cholera invasion.*

Urban prophylaxis. The cholera microbe resides in the fæces of the sick and in those of many healthy individuals; therefore the urban struggle against the epidemic must consist exclusively in successfully dealing with the excreta, but this task is not one that

can be undertaken on the spur of the moment. The pail system and privies must be things of the past, and no town can cease to fear infection until its system of sewers is in a perfect condition, from its water-closets to its final and distant discharge outlets. Urban prophylaxis against cholera may, therefore, be summed up in a few words: *an incessant, determined and methodical fight against fæcal matter, before, during and after the epidemic.*

Individual prophylaxis against cholera depends on two main principles: the prevention of the cholera microbe from entering one's body, and if in spite of all precautions the microbe has found its way into one's digestive tract to prevent it from manifesting its presence there. To accomplish the first aim, the individual should attend not only to his drinking water, but also to his food in general. Water and milk should be boiled, food should be well cooked and served hot, and kept from flies; no food should be eaten which is not cooked at home; flies must be kept down—say, by formol—especially if the water-closets are defective, or if stables and manure heaps are in the neighbourhood. If, in spite of all precautions, the microbe has somehow managed to enter one's body, this latter should be protected from all causes which might bring about any intestinal trouble, such as chills, over-eating, unripe fruit, &c.; in other words, one should keep one's intestinal balance.

As regards the patient, since his dejecta—vomit and excreta—contain the dangerous microbe, everything that has been contaminated by these, or in contact with his mouth or anus, must be at once disinfected. The vessels containing the dejecta must be protected from flies whilst being carried about, their contents must be disinfected—or, better still, burnt, when this is possible—and the recipients then sterilised. The bed and the patient must be placed under a mosquito net, and the vessels which contain his food, drink, or medicines should be enclosed in a wired safe, so as to prevent all access thereto of flies. No meal should be taken in the sick-room, and hands should always be disinfected after touching the patient. In a word, prophylaxis consists in destroying the microbe at the very moment of quitting the patient's body, and before it has had an opportunity of becoming disseminated.

As regards the future, the land route from the East to Europe—the one already preferred by cholera—is about to be largely developed, and the plans have already been drawn up. There will be no protecting deserts, no lengthy sea voyages, during which cholera can be stamped out on board ship. The rapid propagation along the railroads will suffice to bring cholera into Europe every time that it undergoes the slightest recrudescence in the Indian peninsula. Urban prophylaxis alone will be able then to contend against the ceaseless threatening danger; the problem resolves itself into this: *Will the networks of the sewers be everywhere ready before those of the railroads?*

J. E. Nicholson.

Translation.

PRELIMINARY STATEMENT ON THE RESULTS OF A VOYAGE OF INVESTIGATION TO EAST AFRICA.

By R. Koch.

(Translated from the German by P. Falcke.)

In December, 1904, I travelled to German East Africa by commission of the Imperial (German) Government, to institute enquiries as to combating the Coast fever of cattle in the colony, which was said to be widely disseminated. For this purpose it was first of all necessary to confirm the actual spread of this disease in a reliable manner. It is a well-known fact that cattle from healthy regions become affected when they are taken to the infected coast, whereas those animals that are bred there remain healthy. It was accordingly resolved to import cattle from the principal stations of the colony to Daressalem, and to put them out to graze on severely infected pasturages, in order to test their liability or immunity to the disease.

In consequence of the great distances from which the animals had to be driven, it was two to three months before all arrived at their destinations, and I employed the time in the study of relapsing fever. The disease is undoubtedly endemic, but such cases as had been met with had always been mistaken for malaria, and it is only a year ago that the disease has been correctly diagnosed, by microscopical examination of the blood. Once attention had been directed to the disease its frequency was recognised, and investigations as to the cause of its origin were begun, leading to the conjecture that a species of tick might be implicated. I procured a number of these ticks, and succeeded in demonstrating spirochætæ, which appeared to be identical with the spirochætæ of relapsing fever, in some of them. This discovery naturally suggested the necessity of following up the question on the spot, that is to say, on the caravan track. I therefore undertook an expedition in company with Staff-Surgeon Dr. Meixner by the caravan route to Morogoro, a ten days' march.

Soon after our arrival there, we received the announcement by telegraph that cases of a disease, suspected to be plague, had occurred in the Rubeho Mountains, south of Mpapua, and that the outbreak had been preceded by a remarkable mortality amongst rats. This alarming news caused us to travel thither to see if there was an outbreak of actual plague. Fortunately we were able to establish that there had not been a single undoubted case of plague, and that the mortality amongst the rats had nothing to do with plague, but was caused by the larvæ of a gad-fly.

I then visited the Uhehe country, where two years ago a few undoubted cases of plague had occurred, and where recently a suspicious mortality had been observed amongst the rats. In this place also the rat mortality was found to be referable to the same larvæ.

During the march into the interior of the Protectorate I passed through many tsetse-fly localities. This was particularly the case on the homeward march, when I made a detour into the Uluguru Mountains in

order to investigate a rather important centre of leprosy. It had not originally been my intention to undertake any work on "tsetse," but the opportunity was so favourable that I was involuntarily drawn into investigations on the tsetse-flies. This took up a considerable time, but led to interesting results.

On my return to the coast I found that a number of oxen had arrived, and that some of them had already fallen ill with Coast fever and Texas fever. This afforded me an excellent opportunity to continue the investigations I had formerly begun in Rhodesia on the history of development of the piroplasma. In Rhodesia, in consequence of the unfavourable climatic conditions, I had not been able to make much progress, and had only discovered the first indications of a further development of this interesting parasite in the tick. I had now at my service a wealth of material in a climate suitable for the development of the ticks and the parasites they harbour. Here again, was a proof of how greatly the success of such research depends on the correct choice of time and place. This time I succeeded without difficulty in tracing the history of development of the piroplasma to the forms assumed in the ova of the tick.

In addition, I continued my study of the tsetse-flies, and as Daressalem was not very favourable for this purpose, I removed my headquarters to the biological experimental station of Amani, where there is a well-arranged laboratory, and around which the Usambara Mountains furnish extensive tsetse centres for study.

As I gained further rather important results in the course of these observations, I considered it expedient to visit Uganda before my return to Europe to gain personal information on sleeping sickness, and to ascertain in what measure my observations on the glossina of tsetse disease coincided with those on *Glossina palpalis*, the carrier of sleeping sickness.

I give here briefly an outline of the most important observations and discoveries I made in these expeditions, and hope later on to publish a detailed communication on the subject.

Relapsing Fever.

The relapsing fever which is prevalent in German East Africa differs in but few particulars from the European form of this disease. The brevity of the individual attacks is particularly remarkable, as also is the small number of spirochætæ discoverable in the peripheral circulation. The African spirochætæ appear to me to be, on an average, longer than the European variety. I have never seen chromatin bodies in the spirilli, which would have presumed their relationship to some trypanosoma; neither did I observe any indications of either an undulating border or of longitudinal division. On the other hand, gaps were frequently seen, which gave one the idea that the parasite increased by transverse division[1] (fig. 1).

Monkeys could always be infected with certainty by means of subcutaneous injections of "relapsing blood." The disease thus artificially induced ran a severe course, sometimes even terminating fatally. The spirochætæ are more numerous in the blood than is the case in man.[2]

African relapsing fever is transmitted by the bite of a tick.[3] This tick, *Ornithodorus moubata* (Murray), lives in the floors of the huts of the natives. At night it comes out, sucks the blood of the inmates, and again conceals itself in the floor during the day. They are also regularly found in the floors of the so-called *bandas*, or shelters under which caravan travellers pass the night, but only in those parts not exposed to rain. The ticks are probably distributed over the entire Protectorate, and are also found in localities far removed from caravan traffic.

When a tick has sucked the blood of a man or monkey suffering from relapsing fever the spirochætæ do not multiply, but in the course of a few days disappear from the stomach of the tick. If, however, such ticks be examined more minutely it will be discovered that in a certain number of them spirochætæ can be demonstrated on the surface of the ovary. This examination is effected in the following manner: The ovary is squeezed out of the tick, teased out on a cover-glass, spreading it out as much as possible, allowed to dry, and then stained with a solution of azur-eosin. The spirochætæ are then mostly found in such numbers and arrangement that a considerable increase must undoubtedly have taken place. This demonstration is most successful in cases where the ova are in an early stage of development.

After the ticks have deposited their eggs the spirochætæ will also be found in their contents. There are, however, only a few groups of eggs, and in these again only a few eggs which are infected. At first only single specimens or groups consisting of a few, are found in the eggs, later on they are more numerous and often form conglomerations (fig. 2). It therefore appears as if they continue to multiply within the egg. I have not observed any alterations which would lead one to construct a hypothetical cycle of development.

The young ticks from infected localities are capable of infecting monkeys on which they have been applied.[4]

Of the ticks examined for spirochætæ, 5·15 per cent. were usually found to be infected, and in a few cases this number rose to 50 per cent.

Infected ticks were found in all locations on the caravan route from Daressalem to beyond Kilossa, in the direction of Mpapua, and on the track from Kilossa to Tringa. They were also found in the villages of the Rubeho Mountains, and in locations away from the caravan routes.

Neither of the three Europeans who were with the caravan suffered from relapsing fever, because they

[1] The plate has been prepared from drawings made by Dr. Kudicke, with Zeiss' drawing apparatus, from the original preparations, and with an enlargement of 2,500, and redrawn in our office, as the blocks illustrating the German original were hardly sharp enough for advantageous photographic reproduction.—Ed. *J. T. M.*

[2] As far back as the end of 1903 Dr. Kudicke succeeded in transmitting African relapsing fever to monkeys.

[3] During the expedition I was unable to obtain the current literature of the subject, so that it was only later that I heard that that cute investigator, the late Dr. Dutton, had simultaneously infected monkeys with relapsing fever by the agency of ticks. Compare *British Medical Journal*, February 4th and May 6th, 1905.

[4] Hitherto I have succeeded eleven times in this experiment.

never passed the night in native huts, nor did they sleep in the *bandas*. Of the five native servants who observed no such precautions, four were attacked with the disease. Of the sixty carriers, none had relapsing fever, although they slept in huts or under the shelters. This was probably because they had been infected on former expeditions, and so acquired immunity.

Certain observations demonstrate that fever has always been widely distributed and endemic in German East Africa. The natives, as a rule, contract the disease during youth, and consequently acquire more or less immunity, so that they either escape or get only single slight attacks. The European can best protect himself from infection by pitching his tent only on spots which have not been used by others for camping.

Amongst the cattle examined by me in Daressalem I incidentally found that two oxen were suffering from the cattle spirillosis discovered by Theiler. In these animals also, I succeeded in tracing the spirochætæ to within the ova of the ticks.

(To be continued.)

Correspondence.

WYTMAN'S GENERA INSECTORUM. 26th Fasciculus.—Culicidæ. By F. V. Theobald.

The above publication may be presumed to mark the termination of the tentative stage of Mr. Theobald's work on the classification of the Culicidæ, and the presentation of his results in a more or less definite and final form, so that it may be opportune to consider how far the proposed classification can be said to fulfil its purpose.

Putting aside the *Corethrinæ* in which the structure of the mouth presents such radical anatomical differences, that, apart from the accidental similarity of their wing venation, no one would have thought of grouping them in the same family with the Culicidæ, it must be premised that the family is characterised by such uniformity of structure that there is no real need for multiplying the number of its constituent genera, apart from considerations of convenience. The difference in the proportional length of the palpi in the two sexes furnished the earlier collectors with the four genera that were alone firmly established when the writer, in 1900, published his compilation of published descriptions of species, but such a number was even then obviously insufficient, as the genus *Anopheles* included thirty, and that of *Culex* no less than 159 names.

Added to this, the hygienic importance of the family led to such great activity in collecting that an enormous mass of material, including some hundreds of new species, flowed into the British Museum, and the most difficult problem presented to Mr. Theobald, to whom the work of classification and examination was entrusted, was to find some plan of reducing the family into genera of more manageable dimensions.

This he believes he has has accomplished by the adoption of *scale-structure* as a basis of generic distinction, but it must be confessed that the result is somewhat disappointing, as the genus *Culex* is already more crowded than ever, and now includes no less than 175 species, and is still growing ; or, in other words, more than 44 per cent. of the four hundred and odd species enumerated remain crowded together as one of 67 genera enumerated.

Of these 67 genera no less than 52 do not contain more than four species, and 32 of these include but a single species.

In the *Anophelinæ*, where, not scale-structure but scale-distribution has been mainly relied on, the result is fairly satisfactory, in other words, in four or five of the thirteen or fourteen new genera; but whereas in the *Culicinæ*, scale-distribution is painfully uniform, the number of genera including but a single species is so large that it is obvious that the characteristics relied on, viz., that of scale-structure, is in no sense of generic, but merely of specific, value ; and, even in the *Anophelinæ* the same result has followed wherever scale-structure alone has been adopted for the distinction of genera.

The net result is that the identification of species would be far easier by a merely artificial system of tabulation, until some characters of better generic value than scale-structure can be hit upon, and this we appear to be as far as ever from discovering.

The fact is that any system which relies on one class of character alone is sure to break down in practice, because classification on such a basis, necessarily results in a grouping as little natural as a frankly artificial tabulation, with none of the advantages of the latter in the matter of ready recognition of species.

Some of Mr. Theobald's genera will no doubt stand, especially his earlier ones; the genus *Stegomia* forming undoubtedly, a fairly defined and natural group of species ; and the same may be said of *Mansonia*, through the weakness of scale-structure as a generic criterion must be evident to any one who is at the pains to examine closely the wings of the various species,, for why some of these should not be placed in *Tæniorhynchus*, if judged by their wing-scales alone, is a matter that is difficult to understand.

Coming to *Tæniorhynchus*, it can easily be seen, that while the original definition of Arribalzaga brought together a distinctly natural group, the modified diagnosis of Theobald excludes many obvious congeners and includes a number of undesirable aliens.

Space forbids any further criticism of individual genera, but the above examples should suffice to indicate the grounds that have gradually led the writer to regretfully abandon the use of Mr. Theobald's classification. Nor is he alone, for recent criticism shows that these opinions are shared by those whose position as professed entomologists entitles them to be constituted as judges on such a question.

Six months ago Captain James and Captain Liston, I.M.S., produced their monograph of the Indian anophelinæ, rejecting Mr. Theobald's classification for much the same reasons as those advanced above, though that work and the critiques on it had not been seen by the writer at the time the earlier portion of this article was penned, the dates being about contemporaneous.

The process of genus making, however, goes on as merrily as ever, for the worst of work of this sort is that it is infectious, and a busy group, including Blanchard in France and Miss Ludlow in America, seem to be conspiring to make the recognition of a mosquito an impossible task, even for naturalists, let alone for medical men. It may be well, therefore, to quote textually the opinions on this subject of two of our best known British dipterologists as expressed in the critiques above alluded to on James and Liston's work.

Mr. Verrall, in the *Entomologist's Monthly Magazine* for May, 1905, p. 121, says: "The writers do not profess to be ultra-scientific entomologists, and thereby show their common-sense, and probably better true science than the genus and species makers who have preceded them. At any rate there remains the fact that their species will be easily and accurately recognised, while the works of Theobald will prove stumbling-blocks for generations. They have wisely ignored the insufficiently distinguished genera of Theobald, which have commonly been founded on minute and practically indistinguishable characters, and which are consequently valueless to the 'field' naturalist."

In another review of the same work, which appeared in the *British Medical Journal*, June 10th, 1905, Mr. E. E.

Austen, if less emphatic, is obviously of the same opinion, as he records his opinion that "For the reasons stated, therfore, we are disposed to agree with the authors in their conclusion that while differences of scale-structure are undoubtedly of great value in the distinction of *species*, such differences as are present, at any rate among Anopheles are not sufficiently important to be considered of generic value."

Once this is admitted, the whole basis of Mr. Theobald's classification falls to the ground, but meanwhile the game of genus making goes merrily on, and each new species that comes to light is made a pretext for the establishment of a new genus. For the genus makers this amusement is doubtless highly satisfactory as a labour-saving expedient; because it is far easier to describe your species and call it a genus than to go to the pains and labour involved in fitting it in to some existing group; but it is quite the reverse for those who are frequently called upon to identify mosquitoes.

At the time of the issue of the second edition of the writer's "Handbook of the Gnats or Mosquitoes" the process had not gone far; and while somewhat distrustful of several of the new genera, the results were in many cases satisfactory and useful, so that, having nothing better to propose, and recognising the urgency of the subdivision of the unwieldy recognised genera, it was felt desirable to fall into line with so authoritative a publication as a British Museum monograph.

The growing complexity of the classification, as further evolved in the third or supplementary volume of the monograph, however, made him feel that any further adoption of the classification of the monograph would be a distinct mistake in a work primarily intended for the use of medical men, so that, in issuing his "Revision of the Anophelinæ," while employing Mr. Theobald's new names, the writer declined to employ his genera as a key to the recognition of species, feeling that neither he nor his readers could be trusted to sort out mosquitoes by the plan proposed. The memory of prolonged helpful correspondence and pleasant days of work together made him loth to bring this disapproval more prominently to notice, but the rapidly increasing rain of new genera is bringing such utter confusion to the subject that he feels it incumbent as one who, if not a professional naturalist, was yet the first to take up the subject systematically, to add his voice to the protests of those far better qualified than he to judge on such points.

G. M. Giles.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the Journal of Tropical Medicine *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"The Australian Medical Gazette," December 20, 1905.

An Epidemic of Acute Dysentery Occurring at Rutherglen. J. R. Harrison.

In Rutherglen, a town on the Murray River, Victoria, Australia, an outbreak of dysentery began on January 22nd, and lasted until June 6th, 1905. During this period 53 cases of typical dysentery were seen and treated by Dr. Harris, who reports the epidemic.

Of the 53 cases 7 were observed in children from 6 months to 2 years old, with four deaths; 11 cases occurred in children from 2 to 8 years old, with no deaths: the remainder occurred at ages varying from 15 to 79 years, and of these three were females, aged respectively 20, 22, and 27 years, and one male, aged 79, died.

Dr. Harris found treatment by bismuth, opium and mist. creta, ipecacuanha and pulv. ipecac. Co. and calomel, useless in the severest cases. He gave up these drugs in favour of Epsom salts, which he prescribed as follows:—

℞ Mag. sulp.		grs. xxx.
Acid sulp. dil.	}	āā ɱx.
Tinct. belladonnæ		
Liq. opii sedat.		
Liq. strychniæ		ɱv.
Aq. piperitæ		ad. ʒi.

One ounce every three hours.

This mixture acted immediately, and the results obtained were "all that any one could desire."

The cause of the outbreak was attributed to the water supply, which is laid on unfiltered from the Murray River, but analysis has thrown no light on the water being the source of infection.

The bacteriological results of the stools and of the blood showed:—

(1) No Shiga bacillus in the stools.

(2) A para-typhoid bacillus was present in excess of the common fæcal colons.

(3) The patient's blood yielded a positive agglutination reaction to the above bacillus, suggesting a causal relation between the bacillus and the dysentery.

"L'Europe Coloniale," December, 1905.

Un Mission a Lang-Bian. Dr. Vassal.

The author gives a vivid picture of the difficulties with which a doctor has to cope when working among semi-civilised people. The Annamese hiding themselves, or only consenting to have their children vaccinated when bribed with beads and tobacco; and it was only by availing himself of ostensibly chance scratches when vaccinating that he could get sufficient specimens of blood to establish the malarial index of the population. Two types of parasites were found—malignant tertian and the benign tertian—and 64 per cent. of the natives were affected. Dr. Vassal appears surprised to find malaria at Celoa in Reunion at a height of about 3,800 feet, but as a matter of fact, such an elevation is quite insufficient to affect the question in ordinary tropical or sub-tropical climates.

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4.—Authors desiring reprints of their communications to the Journal of Tropical Medicine should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communications.

RHINO-PHARYNGITIS MUTILANS (DESTRUCTIVE ULCEROUS RHINO-PHARYNGITIS): A PROBLEM IN TROPICAL PATHOLOGY.

By James Farquharson Leys, M.D.

Surgeon, United States Navy.

It is the purpose of this paper to call the attention of the profession to a pathological condition which prevails in only a few limited areas in the world, so far as known. This condition may, perhaps, be a late stage of frambœsia or yaws, or a sequel of that disease; or it may be a peculiar manifestation or a sequel of some other known or unknown constitutional disease. On the other hand, it may be a localised special affection, independent of any other disease, a disease peculiar to itself and caused possibly by a fungoid or bacterial invasion.

To introduce this subject to the reader's attention I cannot perhaps do better than quote at length from my annual report, as senior medical officer in the Island of Guam, to the Surgeon General of the Navy, for the calendar year 1904. The quotation follows:—

"*Rhino-pharyngitis mutilans.* (*Destructive ulcerous rhino-pharyngitis*). We have a disease to deal with which no one of us or of our predecessors has understood. We have no name for it except the descriptive one which I here propose. Many cases of it in the remoter pueblos and in the country have not been seen. The disease, early in its progress, affects the quality of the voice and in an advanced stage renders the face repulsive, so that many of its victims avoid public notice. Between forty and fifty cases have been seen, treated, and studied as long as they could be kept under observation. Many others are known to exist that will not present themselves for treatment. It is estimated that there are from 100 to 150 cases in the island. Among those seen regularly one case aged 3 and one aged 4 died, and another aged 9 was carefully observed and treated for several months, and was improving steadily, when she left Aqaña for Merizo. These three have been the youngest cases seen. The rest are of all ages up to eighty years.

"It is not unusual for a casual visitor here, even a medical one, to remark: "You have leprosy here, don't you? I met a leper as I was coming up the road." We can assure such an one that we have segregated all the known cases of leprosy in the island, and believe we have them all. He has met one of our noseless victims of rhino-pharyngitis.

Clinical Signs and Symptoms.

"The usual history of a case of this disease is as follows:—The patient, if seen early, as few are, complains of sore throat. On examination an ulcer is seen on the back of the pharynx, on a posterior faucial pillar, or on the free edge of the palate. It is superficial, movable, covered with a thin, dirty, brownish-grey pellicle of slough. This appears to be the initial lesion. The pellicle breaks down and leaves an ulcer which steadily increases, advancing up the throat into the posterior nares. The disease begins in the soft parts, but after reaching the soft palate and eating its way through its entire thickness, attacks the bone of the palate and nasal septum, finally destroying these entirely. The disease usually arrests itself at this stage, the ulcers healing, and leaves the victim with no septum, the nasal cartilage and skin fallen in, and the nose and mouth one large cavity. The disease rarely, if ever, advances downward from its starting point. The larynx is unaffected and phonation remains perfect, though articulation and the quality of the voice are sadly deranged, as in a bad case of cleft palate. In a few of the cases, fewer than 10 per cent. of them, the process is not arrested at this stage, and the ulceration destroys the cartilage and skin of the nose and advances upon the face. The upper lip always remains as a bridge across the large opening in the face; but above it, through the anterior nares, one looks into the mouth and down the throat. The tongue is unaffected.

Geographical Distribution and Etiology.

"The disease certainly appears to be of an infectious nature. The process is somewhat amenable to local surgical and antiseptic treatment, with tonics and iodides. But the infection is very difficult to eradicate, and though the process be apparently arrested for a time it tends to recur till it runs its course. Throughout the active stage of the disease, which sometimes lasts months or years, the patients, if so in the first place, remain muscular, well fleshed, and well blooded; their condition being thus in marked contrast to the anæmia and debility which accompany tuberculosis and secondary syphilis. It thus seems to be local, not constitutional, and this suggests that its cause may be of a fungoid nature.

"This disease appears to be known only in some of these islands of Polynesia. It is reported to be common in the Carolines. The local practicante here, an educated Filipino, practised five years in the Carolines before coming to this island. He holds a Hutchinsonian theory of his own that the etiology of the disease may be connected with the eating of rotten sun-dried fish, of which the Caroline Islanders are fond. The Chamorros of Guam have the same weakness. Dr. Daniels, of Fiji, quoted by Manson,[1] definitely excludes syphilis from its etiology, and thinks it may be a sequel of yaws. Dr. Alvarez,[2] of Honolulu, has expressed the opinion that it is syphilitic and has no connection with leprosy. In an allusion made to the disease in a report to the Governor of Guam in March, 1902, Surgeon Arnold, of the Navy, says he is not at all inclined from what he has seen of the disease to ascribe it to syphilis.

"The disease has been assumed by medical newcomers and casuals here to be a form (1) of leprosy, (2) of hereditary syphilis, (3) of tertiary syphilis, or (4) of tuberculosis, or (5) a sequel of yaws. There are good reasons for believing that it is none of these, but a peculiar, independent disease. I shall attempt to summarise these reasons.

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[1] "Tropical Diseases," London, 1903.

[2] Personal letter to Surgeon W. F. Arnold, United States Navy.

(1) "*Argument against Leprosy.*—Only visitors not familiar with leprosy itself have ever thought that it was leprosy. Lepers are not known to suffer from this peculiar form of destructive ulceration and from its effects throughout life, and from no other sign or symptom of leprosy. Leprosy is sufficiently common all over the tropical world where this disease is not encountered.

(2) "*Argument against Hereditary Syphilis.* — It appears in healthy and well-developed persons of all ages, with no signs of hereditary syphilis in their own persons or in their brothers and sisters, and with no signs of syphilis in their parents.

(3) "*Argument against Tertiary (Acquired) Syphilis.* —Acquired syphilis is a common disease in most races over nearly the whole world. It is an extremely rare disease here, and neither primary or secondary syphilis has been seen in a native during the past year, among thousands of persons treated for other diseases, including several prostitutes. This disease is common here, and rare or unknown where syphilis is common. Dr. Daniels, who was in Fiji for years, states that there was no syphilis in Fiji at a time when the lesions observed in this disease were common. The appearance of the primary lesion of this disease in otherwise healthy children of healthy parents, at 3, 4, and 9 years of age, excludes acquired syphilis.

(4) "*Argument against Tuberculosis.*—The victims of this disease have no signs of tuberculosis in other organs or parts. The disease does not extend downward and become laryngeal. Instances are observed of several members of the same family all afflicted with only the peculiar lesions of this disease. Tuberculosis is common here as everywhere, and presents the same lesions here as elsewhere in the world. This disease is confined to a very small part of the world, so far as known.

(5) "*Argument against its being a Sequel of Yaws.*—Yaws is a very common disease in the tropical world. It is common here. About thirty cases have been seen during 1904, seventeen of them in school children (as noted above in this report). While a few of the cases of rhino-pharyngitis give a history of yaws, fewer still show any yaws marks or scars, and the large majority deny a yaws history. None of the three cases of children of 3, 4, and 9 years showed any evidence of having had yaws, and I think none of them had had it. The girl of 9 was a particularly handsome child, with a beautiful unmarked skin. Yaws is a very common disease among the negroes in the West Indies, but no sequel of yaws which resembles this disease is reported there. I have heard that yaws is common and this disease unknown in the Philippines. While it may or may not be true that in every place in Polynesia where this disease exists yaws also exists, yet there are many places where yaws exists and this disease does not. We are ignorant of the etiology of yaws, as we are of the etiology of this disease, and we have no reason, that I can see, to assume that they have the same etiology. I can see no evidence to warrant the assumption that this disease is a sequel of yaws.

"The study of this disease offers a fine field for the labours of any school of tropical medicine which might be disposed to send an investigator with a good equipment to this island."

This long quotation has been made as the best means of bringing this subject to the attention of readers to whom the condition may be as new and strange as it was to me when the above was written. My annual report on Guam, from which the quotation is taken, and of which it forms but a small part, was written under pressure for speed within the ten days following an unexpected detachment from that station by telegram. The part referring to this disease, which I have quoted here, was a hurried attempt to portray this condition, which was to me and my colleagues in Guam a pathological novelty, to the clinical and statistical aspects of which I had intended to devote special attention during the following year had I remained on duty there. During my Guam service no literature on this subject was available for reference except the very brief allusion to it in the article on yaws in Manson's *Tropical Diseases*. Some comment on it, with explanation and modification of some of the statements contained in it, is now in order.

The reference made by Manson to the opinion of Dr. Daniels is not by direct quotation. Manson's statement[1] is: "Daniels says that in Fiji, where syphilis is unknown among the natives, these destructive ulcerations of palate and nose, together with a skin affection like lupus vulgaris—all of which he says are amenable to potassium iodide—are not uncommon; he is inclined, therefore, to regard them as true sequelæ of yaws." I have since had access to some of Dr. Daniel's reports on this subject and will give his views in his own words. First, from an essay on this subject written jointly by J. S. Wallbridge and C. W. Daniels,[2] I take the following statements referring to Fiji: "There are a series of pseudo-syphilitic phenomena met with in the natives, *thought by some to have a connection with yaws*. Syphilis is unknown among the natives. First among these there is a destructive ulceration of the soft palate and fauces and sometimes of the nose. . . . I have twice seen this ulceration under 10 and it is common about twenty. In rarer cases it occurs late in life, and in one woman about 60, on whom I made a *post mortem*, the larynx was involved; there were no tubercles in any of the organs and neither gummata nor other signs of syphilis were present." "That syphilis is unknown amongst the Fijian natives is the experience of every medical man in that group."

Daniels,[3] writing later of yaws as he saw it in Georgetown, British Guiana, makes the following statements: "My experience of yaws has been gained mainly in Fiji. There it is called by the natives 'Coko,' and there can be no doubt that it is identical with the yaws I have seen in British Guiana." "Various ulcerations of the pharynx are met with later in life, and are *by some thought to be the sequelæ of yaws.*" "The chronic pharyngeal ulceration *attributed to yaws* appears much later than the eruption, and *I think is doubtfully caused by that disease.*" The clauses which I have italicised in these quotations give quite a different impression as to Dr. Daniels' views

[1] *Op. cit.*

[2] "Selected Essays and Monographs," New Sydenham Society, London, 1897.

[3] *Brit. Jour. Dermat.*, London, 1896. viii., 426.

from that which I had derived (rightly or wrongly) from the reference to them in Manson's book, quoted just before. Dr. Daniels evidently considered that there was little ground for the assumption that this pharyngeo-palato-nasal condition is a sequel of yaws, or at least he appears to have considered it only an assumption unsustained by any proof. His view would appear to be very much the same as my own.

My reference to Dr. Alvarez, of Honolulu, as holding a belief that these lesions are syphilitic is misleading, and I must correct the wrong impression it might give. I do not know that Dr. Alvarez has ever seen this condition in Fiji, Guam, or any other place in Polynesia. Surgeon W. F. Arnold, one of my predecessors in Guam, impressed by the prevalence of these lesions there, wrote to Dr. Alvarez, at Honolulu, asking him if these lesions were seen there, and if he believed them to have any connection with leprosy. Dr. Alvarez's letter in reply was left on the medical file at Guam, where I read it. His reply to this point was, in substance, that a few people were to be seen among the Hawaiians whose palates and noses had been destroyed by disease, that the lesions were not leprous, and that he regarded such cases as were seen in Hawaii as probably tertiary syphilitics.

In the "Argument against Tuberculosis" I have stated that the disease "does not extend downward and become laryngeal." This is a rule which, like most other medical rules, must admit an occasional exception, as in the one case referred to in the essay of Drs. Wallbridge and Daniels, and quoted above.

In the argument against its being a sequel of yaws, I said: "Yaws is a very common disease among the negroes in the West Indies, but no sequel of yaws which resembles this disease is reported there." This statement was made in ignorance of the literature. As already stated, at the time when this report of mine was written I had not seen any reference to such a pathological condition as the one under discussion except the allusions to it in Manson's chapter on yaws, which I have already mentioned and partly quoted here. I had travelled extensively in the West Indies, had a personal acquaintance with several medical men in the islands, had often discussed professional subjects with them, and I had never heard such a condition mentioned. I had supposed that Dr. Daniels was the first to call attention to it.

Similar lesions, however, similarly assumed to have a connection with yaws, were briefly mentioned by Dr. James Maxwell,[1] in 1839, as having been observed by him in Jamaica.

Certain indolent nose and throat lesions were described by Professor Breda[2] as having been observed by him in Italy in the persons of three Italians who had emigrated to and returned from Brazil, which lesions Professor Breda assumed to be due to a frambœsial infection. From his description of these lesions, however, and from the coloured plates accompanying his article, it would appear that the conditions seen and reported by him were entirely different from that described by Dr. Rat in Dominica, by Dr. Daniels in Fiji, and by myself in Guam. In the personal and clinical histories of these three cases, moreover, Professor Breda gives no facts sufficient to connect them with yaws, a disease of which he had only heard and never, himself, had any professional experience.

Lately I have access to Dr. J. Numa Rat's admirable treatise on Yaws,[1] published in 1891, in which the author describes these naso-pharyngeal lesions, which he regards as belonging to a tertiary stage of yaws.

After the report of the Surgeon-General of the Navy, containing a part of my Guam report, had gone to press, I requested the proof-reader to strike out the statement I had made that no such condition as this had been reported in the West Indies. In Dr. Rat's treatise (1891) the author says:—

"Destructive ulceration of the nares, pharynx and soft palate is one of the later manifestations of yaws. The affection generally begins as a tubercle at one of the parts above mentioned. When it originates in the nose, the early symptoms are those of ozæna; and the ulceration spreads from this organ to the palate and pharynx. It often, however, avoids the nares and commences in the soft palate. The ulceration of the tubercle extends thence, destroying the uvula and velum palati, and the septum nasi, and deeply scoring the pharynx.

"This ulceration may occur twenty years after the last traces of the secondary symptoms, even though the disease had lasted a short time only, and had been apparently effectually expelled from the system, and though the patient may be robust and in apparently good health. It generally begins about the age of puberty in those cases in which the earlier symptoms occurred during childhood; but it may also commence in childhood, and soon after the secondary period.

* * * *

"After a week the patient either develops the symtoms of ozæna, or complains of sore throat. On examination, the tubercle may be readily detected in the anterior nares, or a mirror will reveal the tubercle behind the uvula. After about a month ulceration begins; and, in a month or six weeks more, the uvula, velum palati and septum nasi have disappeared, and the pharynx is deeply grooved and covered with a greenish-white tenacious secretion. . . .

"The ulceration usually ceases about the palate after destroying the uvula and velum palati; but it usually lingers chronically about the posterior nares and pharynx.

"Adhesions may occur between the velum palati and the pharynx, and the posterior nares may be blocked by an excessive growth of granulation tissue, which may also project downwards as far as the œsophagus, leaving a very narrow passage by which respiration and deglutition are performed with great difficulty.

"The percentage of those attacked with the milder form of this ulceration is considerable in some localities in which yaws is endemic. In a district with a population of about 2,000, sixty persons thus afflicted have come under my notice, and possibly many more in the same place were similarly afflicted. It appears to

[1] "Observations on Yaws." Prize Essay. Edinburgh, 1839.

[2] "On Brazilian Frambœsia or 'Boubas.'" *Archiv f. Dermat. u. Syph.*, 1895.

[1] "Yaws; Its Nature and Treatment." London: Waterlow and Sons, 1891.

be specially prevalent in certain parts and rare in others.

"The above figures refer to a certain quarter of the windward district of Dominica, in which it is exceedingly common, and to which it seems to be entirely limited in that island. It is, on the other hand, very rare in South America and the West Coast of Africa, where comparatively few cases came under my observation."

I have not observed any lesion in the nose or throat, either in an early or late stage of this disease, which could be described as a tubercle, nor have I seen the excessive growth of granulation tissue interiorly which is described by Dr. Rat.

In far-advanced and aggravated cases I have seen such granulation tissue externally on the face, on the conjunctivæ, in the eyelids, and in the ulcerating alæ of the nose. It is shown in the eyelids in the accompanying photograph of one of the Guam cases. The only inflammatory process I have seen inside is the

serpiginous ulceration of both soft parts and bone, and the narrowing of the pharynx in some of my cases was brought about entirely by the adhesions and scar-contractions described by both Dr. Rat and myself. With these exceptions noted, his description of the local pathological process and mine are quite similar in all essentials, and I cannot doubt that the condition he describes as so prevalent within a limited area in the island of Dominica is the same that I have seen in Guam.

Manson[1] says: "Corney, in his annual statistical return of the Colonial Hospital, Fiji, 1896, classifies eleven cases under the heading 'Lupoid Ulceration of Posterior Nares and adjoining Pharyngeal Parts (tertiary framboesia)'" Surgeon J. C. Pryor, United States Navy, informs me that when he visited Fiji in December, 1899, Dr. Lynch showed him several such cases as "tertiary yaws." From these statements I infer that the assumed connection between this serpiginous ulceration of the naso-pharynx and yaws has come to be quite generally accepted by medical men in Fiji.

In December, 1905, I had the pleasure of becoming personally acquainted with Dr. Rat, in the course of a visit to the island of Nevis, where, as an officer of the Colonial Medical Service, he is at present stationed. I submitted my own observations and views on this subject, as contained in my Guam report, to him, and we discussed the subject at some length. Dr. Rat is one of two medical officers in Nevis, and has his residence in the district known as Gingerland.

In Dr. Alfred Nicholls' "Report on Yaws in the West Indies,"[1] C. R. Edwards is quoted as having reported the existence of between 300 and 400 cases of yaws in Nevis in 1886; and it was stated for January, 1889, that "in that part of the island known as Gingerland there are probably several hundred cases." As Gingerland is one of several medical districts in the island, and as the total population of the island at that time was given as 13,087, it will be seen that when that statement was written sixteen years ago yaws was excessively prevalent in the Gingerland district, and it is evident, too, that the disease has been generally prevalent in the island for at least twenty years past. Dr. Rat states that it is still excessively prevalent in the island. Dr. Rat was in charge of the limited area in Dominica which has been already referred to, and in which he observed this destructive rhino-pharyngitis to be so common for a period of only eighteen months, and in that short time sixty cases of such lesions came under his observation. At the time I visited him he had been one year in the neighbouring island of Nevis, yaws being excessively prevalent there and having been so for many years. In that one year he had not seen a single case of these naso-pharyngeal lesions in the island of Nevis; and this notwithstanding that the population under his observation in Nevis is much larger than that of the limited district in Dominica in which the rhino-pharyngitis was so common; and that yaws is about as prevalent in the larger Nevis population as it is possible for it to be in any population, and it has been so prevalent, excessively prevalent, there for at least twenty years. Dr. Rat told me that he based his belief that the destructive rhino-pharyngitis of the Dominica district was connected with yaws, was a late or tertiary development, or a sequel of yaws, entirely upon the coincident prevalence of this rhino-pharyngitis in a place where yaws was an excessively prevalent disease. The assumption had, or has, no other basis, and, if I understand his present attitude on the question aright, he feels that such an assumption can be only a tentative one.

Rhino-Pharyngitis and Yaws not Coincident.

If, in the absence of any exact knowledge of its etiology, the prevalence of this peculiar destructive rhino-pharyngitis were coincident with the prevalence of yaws, the assumption of a connection between the two would have a fair basis of probability. But from the facts here set forth it does not appear that there is any such coincident prevalence. The very few spots

[1] *Op. cit.*

[1] "Report on Yaws," by H. A. Alford Nicholls. London, 1894.

in the world, only three or four in number, from which we have reports of the striking prevalence of this rhino-pharyngitis are all in the tropics, and all happen to be in regions where yaws is common. But in all of these regions tuberculosis is common; in all but one, Fiji, syphilis at least exists, and the prevalence of this disease is no more coincident with the prevalence of yaws elsewhere than it is coincident with the prevalence of tuberculosis and syphilis elsewhere.

It may help the European reader to realise the extensive and striking prevalence of this rhino-pharyngitis in the few limited regions from which it is reported if he will apply the figures representing its prevalence in Guam (1 to 1·5 per cent.) or in the Dominica district referred to by Dr. Rat (3 per cent.) in some populations with which he is familiar. Any single case presenting similar lesions in Europe would probably be put down to tuberculosis or tertiary syphilis. But only a very trifling percentage of the syphilitic or of the tuberculous present such destructive lesions of the palate and nose, and the percentage of the total population so affected is insignificant. Suppose, however, the general prevalence of tuberculosis and syphilis and the occasional occurrence of lupoid and tertiary syphilitic nose destruction to be just as they actually are in London and other large cities and towns throughout England. And suppose that in Liverpool alone 3 per cent. of the total population were afflicted with a destructive and mutilating serpiginous ulceration of the naso-pharynx, usually self-limited and having little or no effect upon the general health. In the population of Liverpool some 25,000 persons so afflicted would be at large. And if these lesions were attributed by anyone to tertiary syphilis, we would ask why syphilis should bring about such a state of things in Liverpool and not in any of the neighbouring towns where it is equally prevalent. The percentage of the Dominica district applied to the population of London would give us 180,000 persons with peculiarly mutilated throats and noses at large in the metropolis, a condition of things which would attract some attention, and lead to efforts to ascertain its cause.

At the time I write, January, 1906, after a year's reflection on this subject, I am not inclined to modify materially the opinions expressed a year ago in my Guam report. I think this condition presents a problem in tropical pathology which deserves investigation, that no evidence has yet been adduced to warrant our regarding it as a late manifestation of yaws or of any other constitutional disease, but that it is more probably a peculiar and independent local disease. I think that it may not improbably be caused, like blastomycetic dermatitis, or like madura foot, by the local invasion of some infecting organism, though I am far from wishing to advocate this or any other mere hypothesis as to its etiology.

H.R.H. the Prince of Wales opened a new medical school at Lucknow during his visit to that town.

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THE

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THE PROBLEM OF MEDICAL AID IN SEMI-CIVILISED COUNTRIES.

POVERTY, nationally speaking, if not of the individually biting sort, is a common characteristic of incomplete civilisation, and it naturally follows that countries in this stage of development cannot afford to pay for the services of the fully-trained medical product of advanced civilisation in numbers at all adequate to meet the total demand of their population for medical services.

Half a loaf is, however, proverbially better than no bread, and to at least partially meet the necessities of the case there arises the need for the organisation of a lower and cheaper grade of professors of the healing art. It is only lately that the plan has been abolished in France, and traces of it still remain in our English medical titles, if not in actual practice; while in Russia it is a present fact, but for which the medical examination of that Empire would be even more incomplete than it is.

But if, throughout the enormous temperate regions occupied by the Anglo-Saxon race, there is fortunately no longer any need for an inexpensive makeshift of this sort, it is by no means the case in the even vaster portions of the British Empire, where the white man rules and directs, but cannot colonise in the true sense of the word. "Exeter Hall" may rave in its fanatical ignorance, but is powerless to check the instinct of exploration; and once the white man has gained a footing within savagedom he can no more help ruling than oil can avoid floating in water.

Amongst the first in the field, medical men are always to be found, and their services are always so thoroughly appreciated by the indigenous races that their work forms one of the surest and most effective agencies in reconciling the native to the yoke of civilisation.

The demand for skilled medical aid soon, however, becomes far beyond the scanty financial resources of races which are but taking their first lessons in the arts of modern civilisation, and it becomes an urgent necessity to supplement the supply by training locally an inferior grade of practitioner, which, if not educated up to the standard demanded in older and richer civilisations, is yet capable of doing excellent work under more skilled supervision, and of forming an invaluable agency for the promotion of health and civilisation.

In India this need has long been recognised and catered for by the formation of a distinct branch of the medical service, known as Hospital Assistants. The members of this service are usually drawn from families of good caste, and in small but increasing proportion are sons of soldiers in the native army, a status which counts for a good deal in India.

They go through a three years' course, conducted in their own language, by professors who have graduated in our Indian Universities, working under the superintendence of an European superintendent belonging to the Indian Medical Service, but who, unfortunately, has usually so many other duties that it is impossible for him to take any real personal share in the work of teaching.

The course is quite gratuitous, the students even receiving a subsistence allowance; and on its successful completion they are drafted into the civil or military branches of the medical organisation according to requirements.

The training is an extremely practical one, and if not exactly scientific practitioners, the men who have undergone it have learnt enough to deal with all ordinary emergencies in quite effective fashion, and, in point of fact, form the very backbone of the great and somewhat complicated mechanism for popularising modern science in India; for it is the Hospital Assistants in charge of the little "branch dispensaries" which are dotted everywhere over the country, who represents medical enlightenment for the great bulk of the people. He may know nothing of the communications of the cranial nerves, or of the significance of the tendon reflexes, but he has a good working knowledge of the whereabouts of the great arteries, and may be trusted to treat you for fever or dysentery intelligently and efficiently.

Many, of course, become a great deal more than this by qualifying themselves to read and understand English books, and by observing the practice of their European superintending officers, so that some of them are excellent operators and very sound practical physicians.

In the military branch they now very properly rank as native officers, and very often the grey-bearded old senior assistant is the father of the regiment, and one of the most respected members of the corps.

The success of the Hong Kong Medical School, which we comment on elsewhere, though, of course, it aims at a fuller training, is a good example of what can be done in this direction, and will, we hope, draw attention to the desirability of instituting a similar organisation for the purposes of our African colonies. British Tropical Africa rivals India in area, and now that we are beginning to effectively open up the resources of the back-country the need of a body of medical officials of the type indicated will become increasingly apparent.

Fortunately, our old-established settlements on the West Coast can supply us with an ample number of educated and intelligent Africans to form the *personnel* of such an establishment, so that all that is needed is the mechanism for their education.

For this no elaborate arrangements are necessary, as no costly laboratories and apparatus are either needful or desirable.

The first year should be devoted to teaching visceral and regional anatomy, rudimentary physiology, and enough of the elements of chemistry to make the instruction in dispensing intelligible; while the remaining two years should be given up to the practical work of the profession.

Nor would any large teaching staff be required, as a couple of whole-time professors—one a young officer fresh from home, and the other an experienced Colonial surgeon—would amply suffice, though doubtless, as the school progressed, it would be desirable to strengthen the staff by utilising some of the best of the trained men as demonstrators and assistants.

We are not so sanguine as to hope that such an idea is likely to be acted upon at present, but put it forth in the hope that it may be considered and elaborated in due time by those who are entrusted with the medical organisation of our African Colonies.

AN EXPERIMENTAL REPRODUCTION OF AMŒBIC DYSENTERY BY INTRAVENOUS INOCULATION OF PUS FROM A HEPATIC ABSCESS.

By Surgeon-Major A. GAUDUCHEAU.
Director of the Vaccine Laboratory of Tonkin.

IT is well-known that abscess of the liver is often a complication of dysentery in warm climates, and although our knowledge of the pathology of these infections is still very incomplete, it appears that these diseases are due to amœbæ. In a recent work L. Rogers was able to trace the parasite from the intestine to the liver. Nevertheless, the amœboid nature of hepatic abscess has not yet been entirely elucidated, as the experimental reproduction of this lesion has not been realised.

Dr. Gauducheau therefore tried an experiment on new lines.

He obtained some fresh hepatic pus from an European patient. The pus was not sterile, as is often the case, for he was able to isolate three forms of bacilli from it, (1) the pyocyanic one, (2) a bacillus 3 μ in length, which he would have identified as Shiga's had it not been for its marked motility, and (3) a liquefying bacillus. He made an emulsion of equal parts of pus and salt water, and injected 4 cc. of the mixture into a mesenteric vein of an adult native dog. After an incubation period of 4½ days the animal (which had shown no sign of intestinal trouble up till now) was seized with characteristic dysentery. During the three first days after the onset of the illness the fæces contained numerous amœbæ, 20 μ long, moving with rapidity; they then became more rare, and during the last few days that the animal lived could not be found at all; the motions remained numerous throughout, but towards the end consisted almost entirely of pure blood. The animal died on the eighth day.

The *post mortem* showed the whole of the mucous membrane of the large intestine scattered over with bright red spots, in confluent patches or isolated, surrounded by a small inflammatory zone, but without any ulceration whatever; the line of demarcation was very noticeable, the diffuse inflammation suddenly ceased at the cæcum. The rest of the intestines were quite normal, as were also the other viscera.

In a word, whilst trying to reproduce abscess of the liver by a portal injection, Dr. Gauducheau obtained amœboid dysentery. Although the only one up to date, this experiment demonstrates the convertibility of the infection of suppurating hepatitis and dysentery.

Hanoi, December 1st, 1905.

THE post of Residency Surgeon in Kashmir is almost the only appointment in the hills open to medical officers attached to the Indian Political department.

In place of the "malarial focus," where he usually has to put in his time, the holder finds himself in one of the most delightful of climates; and as a change to the usual hard work of practically administering all the medical institutions of a native state, his duties are purely advisatory and correspondingly light; though far from a sinecure, in view of the number of health-seekers who now annually invade Kashmir. Under these circumstances the post has been very properly regarded as an exceptional one, which should be reserved for men whose health had suffered from the arduousness of service in the ordinary political posts, as it affords an opportunity, advantageous alike to the individual and the state, for an officer to recover his health without the expense of taking or giving furlough.

Recognising these facts, it was officially laid down in the time of that admirable administrator, the late Surgeon-General Harvey, that the appointment should not be tenable for more than five years, and there can be no possible doubt as to the wisdom and fairness of the order, though the period might perhaps have been curtailed to two or three years with advantage to the Service.

We hear, however, that this wholesome rule is to be abrogated in favour of the present holder of the appointment, who is to be allowed to hold it indefinitely.

It may be admitted that the officer in question has an exceptionally brilliant record, but there are other ways of rewarding and of utilising his talents than that of consigning him permanently to this Indian Capua, and we trust that should this meet the eye of the Secretary of State for India he may enquire into the matter, and should there be any foundation for the rumour, place his veto on what might be described by ill-natured people as something very like an instance of "influence."

THE COLLEGE OF MEDICINE FOR CHINESE, HONG KONG.

WE are pleased to gather from the Calendar for 1906 that this College thrives. No fewer than thirty-five students are in attendance, and since 1892, when the first students took their diplomas, twenty-four men have attained that honour. The examinations to which the students are subjected are maintained at the standard of examinations for degrees and qualifications in Britain. The Chinese, as any one who has had to do with young Chinamen either at home or abroad knows, are excellent students, earnest, hard-working, easily taught and intelligent to a degree. The list of teachers shows that the various subjects are taught by men not only well qualified, but many of them experts in their subjects. Of the original teachers in the College in 1887, when the College was first founded, one is rejoiced to see that the Honourable Dr. Ho Kai, C.M.G., Dr. Gregory P. Jordan, and Dr. J. C. Thomson, still give their valuable services to, and preserve their interest in, the College. Dr. Thomson has, by his tact and organising ability, done more than any other member of the staff to maintain and forward the interests of the College. The medical men resident in Hong Kong, past and present, ably assisted by local scientific men and medical officers of the Army and Navy on the Chinese Station, have, for many years, without pay or reward, given their time, experience, and in many cases their money, to further the interests of the institution. The work these medical men are engaged in is imperial in the widest and best sense of the term; they are presenting modern medicine, and particularly British medicine, at the gates of China, and offering the best they have to give to the people of China. It is easy to wax eloquent over such a theme, but even the most facile pen or fluent speaker cannot do justice to the possibilities of the work the staff of this College are engaged in. Could, however, the possibilities be brought home to the people of the Empire the students of the College would be as many thousands as now they are tens. Much good work has been and is being done, but the lack of encouragement from those in power, or possessed of means, leaves the College de-

pendent upon the self-sacrificing efforts of a few busy doctors, who have to give the few hours they can snatch from their daily toil in a tropical climate to instruct the students without pay, reward, or recognition. Could the meaning and importance of this College be brought home to British folk we would have in Hong Kong a teaching University of the first rank; and instead of turning to Japan, where German is the scientific language of the class-room, the Chinese would turn to an institution where the foreign language they are best acquainted with—namely, English, is the medium of instruction. The prestige accruing to Britain and British medicine, were this fulfilled, must surely be apparent to all, however narrow their imperialism; and it only wants one Governor of the Colony of Hong Kong to take the matter in hand and appeal to the patriotism of the nation to develop a scheme of superlative importance to the welfare of China and to the pre-eminence of Britain in the China Seas.

Abstracts.

MOSQUITOES AND YELLOW FEVER (Moutiques et Fièvre jaune). By Dr. Chantèmesse and Dr. Borel. 1 Vol. in 16. Price 1s. 6d. Baillière et Fils, Paris.

The subject is introduced by the following quotation from Article 182 of Chapter V. of the "Sanitary Convention of Paris, 1903," on the subject of yellow fever:—

"The countries specially interested are recommended to modify their sanitary regulations in such a manner as to bring them into relation with the actual data of science on the method of transmission of yellow fever, and especially on the part played by mosquitoes as carriers of the germs of this disease."

The following points have been established:—

(1) That the virus of yellow fever circulates in the blood.

(2) That the mosquito *Stegomyia fasciata*, after being itself infected for *at least twelve days*, is capable of propagating the disease.

(3) That *Stegomyia fasciata* is the only mosquito capable of playing this part.

The whole world is therefore divisable into two vast regions; in the one *Stegomyia* can live, it is consequently liable to infection by yellow fever; in the other *Stegomyia* cannot exist, and it is therefore not liable to become infected.

The Stegomyia mosquito is widely distributed round the earth, but its habitat is strictly defined by the two parallels of 43° of latitude, both north and south; it has never been found outside these limits, and any country situated beyond these parallels ought to be free from yellow fever.

A temperature of about 82° F. is necessary to enable the Stegomyia to exist in a normal condition, and more especially to carry on its functions of reproduction, so that even under the most favourable conditions if a few specimens of this insect were brought to France or England by a ship, although they might live for some days, their reproduction could not take place.

A country liable to infection may become contaminated in one of two ways:—

(1) If a patient in the dangerous stage of yellow fever is admitted thereto, and if Stegomyia is found to exist there permanently.

(2) By the importation of Stegomyia mosquitoes previously infected, which after contaminating healthy human beings, then find the conditions necessary for their existence, and especially for their multiplication.

An interesting historical and critical study of the several local outbreaks of yellow fever in Europe is now given at some length, and from which the following conclusions are arrived at:—

Yellow fever has almost entirely disappeared from Europe since 1870; the improvements in shipbuilding since this date have rendered difficult the preservation, and especially the multiplication, of mosquitoes on board modern vessels; there is no insurmountable difficulty in eliminating from our ships the chance specimens of Stegomyia which might occasionally stray there (especially in the engine-rooms), and in thus suppressing the last chances of propagating yellow fever in our own country.

The prophylaxis of yellow fever may be summed up as follows:—

In countries where Stegomyia exists, the patient should be protected from mosquito bites, and the insects should be destroyed wherever possible, as also their breeding grounds.

In other countries, yellow fever may be considered as a non-contagious and non-transmissible disease, calling for no special measures. The bodies of persons dying of yellow fever in the Colonies may therefore be brought home.

J. E. NICHOLSON.

SOME OF THE REGULATIONS CONCERNING PLAGUE, CHOLERA, AND YELLOW FEVER DRAWN UP DURING THE SECOND INTERNATIONAL SANITARY CONVENTION OF AMERICAN STATES, OCTOBER, 1905.

(i.) IMMEDIATE notification of the disease, stating place, date, number of cases, and, in the case of yellow fever, whether the mosquito *Stegomyia fasciata* is in the locality; and in the case of plague, whether rats or mice are infected.

(ii.) Foreign countries to be notified through their Consuls, and weekly notifications to be issued until the outbreak ends.

(iii.) The exact limits of the area imputed to be infected to be declared.

(iv.) Neither plague, cholera, nor yellow fever can be transmitted by merchandise. It only becomes dangerous in case it is soiled by pestous or choleraic products, or, in the case of yellow fever, when the merchandise may harbour mosquitoes.

(v.) All rags and clothing from districts infected by

cholera or plague suspected of being soiled are to be disinfected or destroyed.

(vi.) Ships infected with plague are to be subjected to the following regulations :—

(1) Medical visit (inspection).

(2) The sick are to be immediately disembarked and isolated.

(3) Other persons should also be disembarked, if possible, and subjected to an observation which should not exceed five days, dating from the day of arrival.

(4) Soiled linen, personal effects in use, the belongings of crew and passengers which, in the opinion of sanitary authorities, are considered as infected, should be disinfected.

(5) The parts of the ship which have been inhabited by those stricken with plague and such others as, in the opinion of the sanitary authorities, are considered as infected, should be disinfected.

(6) The destruction of rats on shipboard should be effected before or after the discharge of cargo as rapidly as possible, and in all cases with a maximum delay of forty-eight hours, care being taken to avoid damage of merchandise, the vessel, and its machinery.

For ships in ballast this operation should be performed immediately before taking on cargo.

(7) On ships suspected of plague the crew and passengers may be subjected to observation, which should not exceed five days, dating from the arrival of the ship. During the same time the disembarkment of the crew may be forbidden except for reasons of duty.

The destruction of rats on shipboard is recommended. This destruction is to be effected before or after the discharge of cargo as quickly as possible, and in all cases with a maximum delay of forty-eight hours, taking care to avoid damage to merchandise, ships, and their machinery.

(vii.) If an area should no longer be considered as infected, official proof must be furnished :—

First : That there has been neither a death nor a new case of plague or cholera for five days after isolation, death, or cure of the last plague or cholera case. In the case of yellow fever the period shall be eighteen days, but each Government may reserve the right to extend this period.

Second : That all the measures of disinfection have been applied ; in the case of plague that the precautions against rats have been observed, and in the case of yellow fever that the measures against mosquitoes have been executed.

Notes and News.

Nursing in India.

The hospitals administered under the Dufferin Fund and the Victoria Memorial Scholarship Fund have increased their surgical and nursing staffs since 1898 by no fewer than ten lady doctors, seven assistant surgeons, and 337 hospital assistants and women. The number of women trained at the hospitals amounts to 447. The Victoria Fund, founded by Lady Curzon in 1901, has trained 160 native midwives, of whom many are doing excellent work.

The Philippine "Journal of Science."

The Government of the Philippines are publishing a "Journal of Science," commencing January 1st, 1906. The Journal is replacing the Bulletins of the Bureau of Government Laboratories, and will include the reports of the work done in all departments of the Bureau. The editor is Paul C. Freer, M.D., Ph.D., the director of the Bureau of Science, with R. P. Strong, M.D., and H. D. McCaskey, B.S., as co-editors. The subscription price is five dollars, U.S. currency, and the Journal can be obtained from the Director of Printing, Manila, Philippine Islands, to whom remittances are to be sent.

Therapeutics.

Chase, Walter B., finds codein, in $\frac{1}{4}$ gr. to $\frac{1}{2}$ gr. or more given hypodermically, is more satisfactory than morphia after abdominal section.

For the relief of intestinal paresis, salicylate of physostigmina in $\frac{1}{100}$ gr. to $\frac{1}{50}$ gr. dose is recommended by the same authority.

Punjab Veterinary College.

When the Ajmere Veterinary School was closed a short time ago, the students and staff were transferred to the Punjab Veterinary College, and about twenty students joined. In view of the great demand which exists for the services of veterinary assistants trained at the Lahore College, which far exceeds the supply, it was decided to increase the number of students considerably and to improve the standard of education. The extra staff from Ajmere made this practicable and the Local Government has provided the extra accommodation necessary, and a new laboratory and classroom have been built in connection with the segregation ward sanctioned by Sir Charles Rivaz, while a spacious lecture-room and offices for a hospital have also been erected.—*Pioneer Mail*, January 26th, 1906.

Poison in Juar Fodder.

Sir,—In the *Pioneer* of the 13th instant you mention the poisonous effect of juari stalks as a curious thing, but at least in the Northern Punjab and Bar tract this fact is known even to every zemindar child. This phenomenon is limited to droughty seasons in Barani tracts only, and to such fields of well-irrigated areas also which have not been watered from wells. The poison may be prussic acid, but the zemindars think that a kind of very fatal and poisonous worm generates in the stalk, and any animal (cow, bull, buffalo) which eats the stalk certainly dies within an hour or two, but goats do not suffer a bit. To remove the poison, zemindars, after cutting such stalks, sprinkle water over them and then bury them for some hours under blankets. Even a little quantity of rain removes the poison from the standing stalks.—*W. Pioneer Mail*, January 19th, 1906.

The Medical College of Calcutta has received £6,000 out of the lac of rupees presented to the Prince of Wales by the Maharaja of Darbhanga for distribution amongst Indian charities.

A Chair of Colonial Medicine in Paris.

M. Emile Flourens, the ex-Minister and present Deputy for the Department of La Seine, advocates the endowment of a Chair of Tropical Medicine in Paris on the lines of those existing in the Schools of Liverpool and London, and furthermore, that only those medical gentlemen who have obtained the diploma in tropical medicine should be allowed to practise in the Colonies; this much is due to the troops, for whom little has been done; to the officials, for whom still less has been done; and to the natives, who, as a rule, have received nothing in return for their loss of independence.—*L'Europe Coloniale et Diplomatique*, January 24th, 1906.

Ankylostomiasis Prophylaxis.

In Belgium, by the establishment of dispensaries for the miners afflicted with ankylostomiasis, and the payment of 1 franc 50 cents. continued daily until the cure was complete, the disease has been stamped out in five of the largest mines.

Desert Camps: a Proposed Method of Treatment.

Felkin, R. W., holds (*Treatment*, January, 1906) that camp-life in the real desert at a distance from towns gives a genuine mental and bodily rest unobtainable elsewhere. The expenses should not be much more than in a large hotel in a city.

On the evening of December 15 last the first official banquet of the "International Medical Association for the Suppression of War" was held in Paris at the Hôtel Continental.

There were about fifty members present, all of them belonging to the medical profession. The chair was taken by Dr. J. A. Rivière (of Paris), the founder and President of the Association.

The after-dinner speeches were all against war, and great stress was laid on the preponderating part which the medical profession throughout the world, by reason of its influence on Society, is called upon to fill in this work of realising universal peace.

The following gentlemen spoke: Professors Langlois and Richet, Doctors J. A. Rivière, Maréchal, Grellety, Suarez de Mendoza, Mazery, Cogrel, and Bérillon.

Although this Association is only a year old, it already numbers 600 members, all of them medical men, and includes more than 200 professors of all nationalities.

A new German Sleeping Sickness Commission.

The *Medical Weekly* of Berlin announces that Professor Robert Koch has been commissioned by the Imperial Government to proceed to East Africa in order to resume his investigation into the causes of the sleeping sickness. Professor Koch proposes to sail at the beginning of April, and it is understood that he will make Entebbe, in British Uganda, the headquarters for his first series of expeditions. It is anticipated the expedition will last about eighteen months, and £6,000 has been allotted for the expenses of the first year.

As our readers are aware, Professor Koch has already passed some time in East Africa in the study of this and kindred diseases, but in view of the successful work of the English commissions engaged in the investigation of sleeping sickness, there is little beyond matters of detail left for Professor Koch's investigation from the etiological standpoint. On this account the Germans would perhaps have been wiser to have sent some of their admirable economic entomologists to study the question of checking the multiplication of the flies concerned in the transmission of the disease, as this department of the army of science is one in which England is, unfortunately, very short handed; and this most practical question appears at present to be almost untouched.

The more than usually mild winter in Britain contrasts peculiarly with the weather experience in Algiers, where deep snow has fallen, breaking down telegraph lines, blocking the railways and causing great damage to property.

The establishment of a medical school for Burmese is contemplated in Rangoon.

Drugs.

Trypsin in Carcinoma.

Trypsin is being given by many practitioners in Britain at the present moment in cases of carcinoma. Perhaps the best method of exhibition is hypodermically, as all possibility of total destruction of the ferment in the stomach is avoided.

Messrs. Allen and Hanbury, 7, Vere Street, London, W., supply Liquor Trypsin Co. for internal use; Injectio Trypsin Co. for hypodermic use, and Pigment Trypsin Co. for local use.

Malarial Fever and Drugs.

We publish a portion of a letter from Mr. J. H. Niemann, Daly River, Northern Australia, which appeared in the *Chemist and Druggist* of February 3rd, 1906: "Is anything known or published regarding the manner in which malarial fevers modify the normal effects of drugs and of other germ diseases? . . . . I have ascertained from painful experience that belladonna cannot be safely given to any person whose system is impregnated with malaria, except in infinitesimal doses; that the effects of many other drugs are diminished or increased; and have strong reasons for asserting that the benign malaria of North Australia greatly modifies all other germ diseases, if it does not entirely prevent them. The first point, regarding the effect of drugs, is of great importance to the prescriber; the second, regarding the prevention of other diseases, is important to everyone, especially as tuberculosis is included in the list of 'other diseases.'"

We must confess we are unable to make any definite answer to Mr. Niemann on this subject. The suggestion is a novel one, but it is possible, now that the attention of our readers has been directed to the action

of drugs in persons suffering from malarial infection, that some information may be forthcoming from medical men engaged in practice in the tropics.

Books and Papers Received.

PROSTATISM WITHOUT ENLARGEMENT OF THE PROSTATE. By C. H. Chetwood.

Chetwood attributes the signs and symptoms of so-called prostatic irritation when the prostate is not enlarged to contracture of the neck of the bladder, in other words, a fibrous stenosis of the vesical orifice. He does not recommend cutting the stricture, but galvano-prostatotomy through a perineal opening by means of an instrument he has devised. His pamphlet is a reprint from the *Annals of Surgery*, April, 1905.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"American Medicine," January 6, 1906.

MALARIA INFECTION IN KURDESTAN.

Underwood, H. L., considers that in Kurdestan malaria is not only carried by mosquitoes, but also by bed bugs, lice and fleas.

Several species of mosquito, including some Anopheletes, however, occur in Central Asia, and from the point of view of comparative helminthology, any such means of transport of malaria as that suggested is in the last degree improbable.

"Le Nevis Scientifique," November, 1905.

CHOLERA PROPHYLAXIS.

Chantemesse, A., and Borel, F. contend that no person suffering from cholera should be allowed to enter an uninfected country. He should be quarantined, the clothes disinfected, food and drink carefully examined, protection against fly contamination, especially where latrines are defective, and every precaution taken to prevent gastric and intestinal upset.

Such recommendations are, however, of a most reactionary type, and if adopted, would carry us back to the bad old days of quarantine. Modern sanitary practice has shown that, under proper precautions, there is no danger whatever in landing cholera patients, and the adoption of these modern measures have rendered the importation of cholera practically impossible in every country where they have been employed. Quarantine has been abolished by all the more civilized nations because it had proved itself unpractical and inefficient.

"American Medicine," January 13, 1906.

AMERICAN HOOKWORM.

Stiles, C. W., and Goldberger, J., find that the eggs of *Necator americanus* may hatch the rhabditiform embryo in less than twenty-four hours. When the young intestinal stage of the worm is placed on the skin of the back of dogs and rabbits the worm penetrates the skin, and reaches the small intestine in from eight to twelve days.

"Journal of Cutaneous Diseases," January, 1906.

TROPICAL ULCERATION OF NOSE, PHARYNX, AND LARYNX.

Fordyce, J. A., describes a case of ulceration of the upper air passages, which began with an offensive muco-purulent discharge from the nose. The nose enlarged and ulcerated, the septum necrosed, the uvula disappeared, and the soft palate presented a worm-eaten appearance; the tongue became atrophied at the base, and the pharynx and larynx showed ulcerations and old cicatrices.

A condition similar and probably identical with the case described was met with by Dr. W. F. Arnold at Guam in 1902. Dr. Arnold found 5 per cent of the population of Guam suffering from this ailment. The disease is neither tubercular nor syphilitic. Breda has described analogous ulcerations amongst Italians returned from Brazil, and named by him *Frambœsia Brasiliana*, or Boubas.

The above is of interest in connection with the paper on "Rhino-pharyngitis Mutilans," by Surgeon J. E. Leys, M.D., U.S. Navy, published in another column, as it seems probable that both papers refer to the same condition.

"Boston Med. and Surg. Journal," January 11, 1906.

MALARIA IN THE PHILIPPINES.

Chamberlain, W. P., from the study of 120 cases of malaria in Camp Gregg, Philippines, concludes that (1) large numbers of anopheles increase the malarial index; (2) Quartan infections were infrequent; (3) Œstivo-autumnal infections were remittent 35 per cent., quotidian intermittent 25 per cent., tertian intermittent 30 per cent.; (4) no distinctive parasites were recognised in the æstivo-autumnal infections.

"Nature," January 4, 1906, p. 235.

INSECTS AS CARRIERS OF DISEASE.

Shipley, A. E., F.R.S., publishes an address to the British Association at Pretoria under the above title. From the nature of the occasion it can hardly be expected to contain any information that has not appeared in these columns, but it forms, nevertheless, a most convenient and up-to-date *resumé* of our knowledge on the subject, which may be consulted with advantage by any one requiring a handy reference paper on this question.

"Indian Med. Gazette," January, 1906, p. 7.

THREE DAYS' FEVER OF CHITRAL.

McCarrison, Captain R., I.M.S. The author describes his paper as a contribution to the unclassed fevers of India. As may be gathered from the title the attacks are short, but they are also sharp, the principal subjective symptoms being bone-aches and frontal headache.

Though hitherto returned as such, the disease is not malarial, as the blood contains no parasites, either protozoal or bacterial. It can hardly be influenza, as, though seasonal, it is confined to the hotter times of the year, coinciding with the mulberry harvest. It is not contagious, though houses and places become infective, so that the disease can only be acquired by visiting them. Those who have suffered are immune to subsequent attacks. Quinine is useless, either remedially or as a prophylactic, and treatment resolves itself into measures to diminish the patient's discomfort, such as sponging and douching.

Many years ago the writer met with exactly similar cases in Natal, and indeed suffered in his own person. At that time the cases were locally known to the profession as "dengue," and were, he believes, usually returned as such.

The uniformly rapid and complete recovery, however, made any such a diagnosis quite untenable, so that personally he returned them as "febricula," for want of any better term.

He feels, however, little doubt as to the identity of the clinical pictures, and it is to be noted that Captain McCarrison, while rejecting the diagnosis, remarks on its similarity to dengue.

We should like to hear from our readers in Natal and Zululand whether such cases are still met with there, and would in such case draw their attention to the circumstance that Captain McCarrison evidently suspects sandflies of being the transmitting agents of the disease, and so suggests the prophylactic use of mosquito nets.

"Revista de Med. y Criug," Vol. ix., No. 22, 1905.

ANAKHRE OR GOUNDOU.

Ayala, A., Havana, reports a case of goundou occurring in Caracas, Venezuela, in a white man, aged 39. The growth on either side of the nose was symmetrical. The man was otherwise quite healthy.

"Reforma Medica," August 12, 1905.

SUBFEBRILE TEMPERATURE OF ANKYLOSTOMIASIS.

Gabbi, W., states that slight elevations of temperature are present in ankylostomiasis. This state, which he terms "subfebrile," is present in severe cases only. The elevation in temperature is irregular, there is either an evening rise, an intermittent, or an irregular subcontinuous type. Caliri finds albumose present in the blood of persons with ankylostomiasis, and believes that it is the presence of albumose in the blood which determines the rise in temperature.

"Quarterly Journal Microscopical Science," November, 1905.

OBSERVATIONS ON HÆMATOZOA IN CEYLON.

Castellani, Aldo, and Willey, A., state they discovered in human blood fine "vermicules" of crescentic form, rather longer than the diameter of a red corpuscle, characterised by the absence of pigment and presence of vacuoles. The specimens were taken from a case of "fever," which showed no malarial parasites and a negative Widal reaction, and are not at all unlike certain known trypanosomes in certain stages of development. Similar bodies were found in the finger blood of fever patients, and the authors do not appear to consider them as freed and altered "crescents," or as necessarily connected with malarial parasites at all. Similar bodies were found in a babbling thrush and in the Indian crow.

"C. R. Soc. Biologie," T. lix., pp. 240-245.

SERUM DIAGNOSIS OF MEDITERRANEAN FEVER, &c.

Nicolle, C. employs for serum diagnosis cultures of the *B. melitensis*, three to six days old, on ordinary gelose, emulsified without preliminary grating in physiological water or bouillon. The suspected serum is added to this in the proportion of $\frac{1}{2}$, $\frac{1}{5}$, $\frac{1}{10}$, $\frac{1}{20}$, $\frac{1}{50}$, and $\frac{1}{100}$, in small test tubes, and the examination is made after sixteen to twenty hours. When distinct agglutination, to the naked eye and under the microscope, is obtained in $\frac{1}{10}$ dilutions, he considers that the diagnosis of Malta fever may be taken as proved.

In the second paper he records the results of the application of Wright's serum reaction to the cases of thirty-five patients affected with various other infections, and shows that serum drawn from them had little or no agglutinating action on the *B. melitensis*.

In collaboration with M. Hyat, in the same publication, he gives results showing the value of the procedure in actual practice.

In five cases, which were ultimately proved not to be instances of Malta fever, the action was negative, while in thirteen others, which presented throughout the clinical picture of Malta fever, it was positive.

The leucocyte formula of Malta fever is an intense mononucleocytosis amounting to 80 per cent. of mononuclear cells.

"C. R. Soc. Biologie," T. xix., pp. 302-304.

DIAGNOSTIC VALUE OF POLYNUCLEAR HYPERLEUCOCYTOSIS OF BLOOD IN TROPICAL ABSCESS OF LIVER.

Khouri, J., out of ten cases examined, found the number of leucocytes was normal in one, subnormal in four, while three showed moderate, and three pronounced leucocytosis. From this it is evident that the symptom or its absence is of little or no diagnostic value.

"Amer. Naturalist," xxxix., pp. 601-724.

THE INTERRELATIONSHIPS OF THE SPOROZOA.

Crawley, H., regards the relationships between the subclasses *Telosporidia* and *neosporidia* as vague, so that the class, taken as a whole, may not even belong to a single phylum. Amongst the Telosporidia he regards the gregarines as the most primitive form, and, amongst the latter, the polycystids. M. F. Mesnil, the well-known protozoologist, commenting on this paper in the current *Bulletin de l'Institut Pasteur*, notes that Crawley ignores the now well-recognised intestinal monocystids, and states his opinion that it is amongst these that the ancestral form should be sought. Both, however, are agreed in considering the Shigogregarines as derived from the Engregarines. He looks upon the Coccidia and the Hæmocytozoa as closely allied, and so approves of Doflein combining them under the title of Coccidiomorpha.

"C. R. Soc. Biologie," lix., p. 308.

ABSORPTION OF TUBERCLE BACILLI BY FRESHLY SHAVEN SKIN.

Nouri, Osman (Inst. Bacter., Constantinople), shaved the inguinal region of guinea-pigs, and then rubbed them with absorbent cotton, fouled with tuberculous sputum, with the result that the corresponding lymphatic glands became swollen in eight to fifteen days, and the animals died in from thirty to fifty days.

This is hardly pleasant reading for those who do not shave themselves, and, in view of the rudeness of of the tonsorial art in Mahommedan and other countries where the victim is scraped with a blunt razor, moistened with water, which the operator not unfrequently supplements, in awkward corners, with saliva, may account for the puzzling location of certain tubercular lesions occasionally met with in such countries, where the portions of the body habitually shaven are much more extensive than is anywhere the case in Europe.

"Centralb. für Bakt. Parasiten. u. Infektionskrank," xxxix., pp. 610-613.

A NEW, CERTAIN, AND HARMLESS METHOD OF IMMUNISATION AGAINST PLAGUE.

Huetope, F., and Kiruchi, J., by experiments based on those of Bail, show that an "agressine" effective against plague can also easily be obtained. A single injection prolonged the life of animals subsequently inoculated with plague, and a second infection enabled them to resist the action of an infection surely fatal to controls, always provided that the inoculation be not practised too soon after the second, in which case the morbidity of an infection is not diminished but enhanced.

They accordingly claim to be the first to devise a sure and harmless plan of immunisation.

"Ann. Soc. Entom.," Paris, lxxiv., pp. 20-28.

EGG DEPOSITION AND THE LARVAL LIFE OF THE TABANIDÆ.

Legaillon, A. As the Tabanidæ are implicated in the transmission of trypanosomes, the author's observations on *T. quatuornotatus*, Meig., possess a special interest for our readers.

The eggs are laid in bunches in places that may be either dry or moist, for instance, on the leaves of plants, and are at first white, but soon darken. As is already known, some

larvæ may be aquatic and others terrestrial, and that their habits are carnivorous. The eggs of the species under consideration hatched out in fourteen days (in June), and are white and transparent.

They feed on dead prey and on organic detritus, and perhaps even on sluggish living animals.

They can live under varied conditions of moisture, and even in water. Further observations are promised.

Personal Notes.

R.A.M.C.

Embarkations. — For India: Lieut.-Cols. B. J. McCreery and J. M. F. Shine; Majors T. W. Gibbard and H. A. Hinge; Lieuts. J. Campbell, W. H. Hills, J. P. Lynch, W. G. Maydon, and L. V. Thurston. For Mauritius: Lieut.-Col. A. Peterkin; Capt. C. S. Smith; and Lieuts. P. Power and C. S. Wallace. For Malta: Major C. C. Fleming, D.S.O., and Capt. H. S. Anderson. For West Africa: Major G. T. Rawnsley and Capt. J. McD. McCarthy.

Ceylon (November 1, 1905).—Lieut.-Col. R. D. Hodson, Capt. L. M. Purser, and Capt. T. B. Unwin, R.A.M.C., are under orders for England, tour expired, and will probably leave Ceylon on January 3rd, 1906, in His Majesty's transport *Dunera*. Lieut.-Col. G. H. Sylvester, Capt. E. C. Hayes, and Lieut. C. R. Miller, R.A.M.C., are expected by the same boat on November 30th, 1905.

Lieut.-Col. G. H. Sylvester, R.A.M.C., takes over the command of the Royal Army Medical Corps and Senior Medical Officer of the Troops in the Ceylon Command. Capt. E. C. Hayes and Lieut. C. R. Miller, R.A.M.C., will be stationed in Colombo, the former performing the duties of Sanitary Officer in addition to ordinary duty.

Sierra Leone.—Capt. H. W. Grattan, R.A.M.C., writes (November 24th, 1905): Capt. W. H. S. Nickerson, V.C., arrived on November 23rd, for a tour of service.

Simla (*India*).—Capt. E. Blake Knox, R.A.M.C. Secretary to the Principal Medical Officer, His Majesty's Forces in India, writes (November 23rd, 1905):—

"*Appointments.*—Lieut.-Col. A. W. P. Inman, M.B., R.A.M.C., to officiate as Principal Medical Officer, 8th (Lucknow) Division, *vice* Col. G. D. N. Leake, R.A.M.C., granted leave out of India. Lieut.-Col. J. R. Dodd, R.A.M.C., to officiate as Principal Medical Officer, Bareilly and Gharwal Brigades, *vice* Col. G. J. Kelly, I.M.S., appointed to officiate as Principal Medical Officer, 7th (Meerut) Division. Col. H. R. Whitehead, R.A.M.C., to officiate as Principal Medical Officer, 2nd (Rawal Pindi) Division, *vice* Col. B. M. Blennerhassett, C.M.G., R.A.M.C., granted six months' sick leave out of India. Lieut.-Col. D. O'Sullivan, R.A.M.C., to officiate as Principal Medical Officer, Abbotabad and Sialkot Brigades, *vice* Col. Whitehead, R.A.M.C., transferred to Rawal Pindi temporarily. Lieut.-Col. D. O'Sullivan has also been confirmed to the Command of the Station Hospital, Rawal Pindi, with effect from November 4th, 1905. Capt. W. R. P. Goodwin, R.A.M.C., to be Personal Assistant to Principal Medical Officer, Northern Command, *vice* Capt. E. T. F. Birrell, R.A.M.C., vacated. Lieut. S. C. Bowle, R.A.M.C., to be Dental Specialist in Western Command."

Singapore (*Straits Settlements*). — Lieut.-Col. W. Dick, R.A.M.C., writes (November 2nd, 1905): "The following officers are tour expired. Lieut.-Col. W. Dick, Major J. H. E. Austin, and Capt. G. F. Sheehan. Notification has been received that these officers are to be relieved in December by Lieut.-Col. H. H. Johnson, C.B., Major C. B. Martin, and Lieut. G. A. D. Harvey. Major J. Ritchie, who was also tour expired, has been permitted to extend his service in Singapore for another year."

The services of Capt. J. Tobin, R.A.M.C., on the Aden Boundary Commission, have been brought to the special notice of the Commander-in-Chief.

Indian Medical Service.

Major Molesworth, I.M.S., Captain Vane and Captain Popham, now on Lord Ampthill's Staff, have been appointed to serve on the Staff of Sir Arthur Lawley, the Governor-designate of Madras.

Major E. R. Parry, M.B., I.M.S., is appointed temporarily to be Superintendent of the Dacca Central Gaol, *vice* Mr. W. A. C. Beadon, retired, with effect from the date of receiving charge of the office.

The services of Captain A. C. MacGilchrist, M.B., I.M.S., are placed at the disposal of the Government of India in the Home Department.

Captain W. D. Ritchie, M.B., I.M.S., Civil Surgeon, is posted to Jalpaiguri.

Major J. S. S. Lumsden, I.M.S. Civil Surgeon, Bahraich, furlough on medical certificate for one year, from December 23rd.

Consequent on the death of Honorary Captain G. McCall, I.S.M.D., Civil Surgeon, Babu Kedar Nath Bose, Officiating Civil Surgeon, Jaunpur, to be confirmed as a Civil Surgeon.

To be Major: Captain Hugh Bennett, M.B., F.R.C.S.E.

Sanitary—Plague.

Lieutenant-Colonel W. B. Bannerman, M.D., I.M.S. (Madras), Director, Plague Research Laboratory, Parel, is granted privilege leave for three months, with effect from November 18th.

Captain G. Lamb, M.D., I.M.S. (Bengal), is appointed to officiate as Director of the Plague Research Laboratory, Bombay, during the absence on leave of Lieutenant-Colonel W. B. Bannerman, M.D., I.M.S., in addition to his special duty under the orders of the Sanitary Commissioner with the Government of India.

Department of Revenue and Agriculture.

Mr. R. E. Montgomery, M.R.C.V.S., Civil Veterinary Department, is appointed with effect from December 8th, 1905, to make, under the orders of the Inspector-General, Civil Veterinary Department, a special investigation into the diseases of camels.

Colonial Medical Service.

Dr. W. T. Kergin, of Port Simpson, British Columbia, has taken over the duties of a Medical Health Officer in that Province of the Dominion.

Fry.—The selection of Dr. W. H. Fry, Colonial Surgeon of Province Wellesley, North, Straits Settlements, for the office of State Surgeon of Pahang, Federated Malay States, has been approved by the Secretary of State.

Purchas.—Dr. F. A. G. Purchas, District Medical Officer for Newport, Manchester, Jamaica, has been transferred to Swanswich Trelawny, in place of Dr. C. T. Dewar, who has retired from the service.

The offices of Dr. E. H. Bannister and Dr. J. W. Hawkins as Health Officers for the Port of Bridgetown, Barbados, have been abolished on the coming into operation of the new Quarantine Ordinance. Both officers receive gratuities.

Dr. J. White Hopkins, Assistant Medical Officer, Sarawak, acts as Principal Medical Officer and Superintendent of Indian Immigrants during the absence on leave of Dr. A. J. G. Barker.

Dr. F. O. Stedman has been made a Member of the Medical Board of Hong Kong, and will serve as Secretary of the Board in place of Dr. Alexander Rennie, who has resigned.

Dr. Alexander Rennie has permanently retired from practice in Hong Kong.

Dr. Smartt has arrived in England from British Guiana.

Dr. Ireland has arrived in England from Trinidad.

Commercial Corporations.

Baggs.—Dr. J. G. Baggs has been appointed Medical Officer to the Para Electric Railway and Lighting Co., of Brazil, and leaves England about February 1st.

Domestic.

Macnicol.—At the Medical Mission House, Kalna, Bengal, on January 20th, 1906, the wife of the Rev. Malcolm Macnicol, M.B., C.M., of a son.

Illius—Ford.—At St. John's Church, Calcutta, on December 30th, 1905, by the Rev. C. R. T. Winckley, Henry Warwick Illius, Capt. I.M.S., to Frances Elsie, younger daughter of the late Matthew and Mrs. Ford.

PLAGUE.

Prevalence of the Disease.

		Cases.	Deaths.
India.—Week ended	Dec. 9th...	—	3,075
,,	,, 16th...	—	3,247
,,	,, 23rd...	4,182	3,170
,,	,, 30th...	5,184	4,278

South Africa.—No plague up to January 20th, 1906, in any part of South Africa since November 18th, 1905, when one case was reported in Port Elizabeth.

Rats and mice were still found plague-infected in Port Elizabeth on January 20th.

		Cases.	Deaths.
Mauritius.—Week ended	Jan. 5th...	4	4
,,	,, 12th...	4	3
,,	,, 19th...	1	1
,,	,, 26th...	1	1
,,	Feb. 2nd...	2	1
,,	,, 9th...	1	0

		Cases.	Deaths.
Hong Kong.—Week ended	Jan. 3rd...	2	2
,,	,, 6th...	2	2
,,	,, 10th...	6	6
,,	,, 27th...	1	1

Persia.—Plague prevailed in the Maisar district of Seisan on January 22nd.

		Cases.	Deaths.
Zanzibar.—Week ended	Oct. 14th...	15	8
,,	Nov. 4th...	12	—

Egypt.—Case of plague reported in Alexandria on November 7th.

Australia.—No fresh cases of plague in Queensland since September 14th. As late as December 20th, 1905, plague-infected rats were found in the neighbourhood of Darling harbour.

Sydney.—Nine cases of plague occurred on a French mail steamer which called at Sydney, and infected rats were found on board the vessel.

Brazil.—From January 1st to October 22nd, 1905, there were 91 deaths from plague in Rio de Janiero.

Madeira. — The report that plague existed at Madeira is contradicted.

The Campaign Against the Rats in Rangoon.

The total number of plague cases for December was 98, with 91 deaths, against 113 cases and 110 deaths during November. The incidence of the disease was heaviest among the low-class Hindu population. One hundred and thirty-two rats were examined, of which 27 were found infected with plague. Fourteen thousand six hundred and sixty-six rats were destroyed during December. Although the total number of cases was less in December than in any previous month since the outbreak of the epidemic in February last, yet no quarter of the Municipality was free from the disease during the whole month. No case is reported from Cantonments. The centres of the infection appear to be widely scattered throughout the municipal area, and there is no indication that the disease has been stamped out in any locality.—*Pioneer Mail*, January 12th, 1906.

Plague Researches.

(1) M. Herzog, from experience of plague gained in the Philippines, finds a hyaline fibrin thrombosis in the glomeruli of the kidney; in *post-mortem* examination of seven out of twenty cases of plague, Dr. Herzog believes that plague is not a true septicæmia, but a local lymphatic infection, and that the universal dissemination of the infecting bacilli through the blood current generally only occurs during the agonal stage.

(2) R. P. Strong has succeeded in preparing a vaccine against plague. He uses the living plague organisms in his protective inoculations. So far, the experiment has proved successful in rats.—*Manila Medical Society*, November 22nd, 1905.

Reviews.

PATENT FOODS AND PATENT MEDICINES. Two lectures. By Robert Hutchison, M.D., F.R.C.P. Second edition. John Bale, Sons and Danielsson, Ltd., Oxford House, 83 - 91, Great Titchfield Street, Oxford Street, London, W., 1906. Price 1s. net.

It is time some one spoke out freely about patent foods and patent medicines, and Dr. Robert Hutchison has done so in fearless terms. Some of his remarks are most telling and express what every medical man, who thinks at all, must have frequently wished to express. He says, "most patent foods exist because certain persons have found that it pays to produce them"; and, we might add, the benefits they bestow upon the public are confined to those few who profit by the production of the articles. The further statement that of the patent foods "not one of them is worth the money asked for it," is an expression of opinion with which every medical man will coincide; and that it is merely the fact that patients will more readily listen to their doctor when he advises patent foods, in place of simple foods prepared at home, that any medical man would ever think of recommending them. The honesty of the doctor is thereby strained, but as he has to live he, calling it tact, agrees with the patient's desires. In regard to patent medicines, Dr. Hutchison shows that they are compounded for the most part of the usual pharmacopœial drugs in ordinary use, and attributes their reputation to "persistent and audacious advertisement." Belief in quackery and patent medicines is "as rife, nay, I venture to say is more rife, in Belgravia than in Bethnal Green," so that so-called education has nothing to do with their belief in the efficacy. These lectures should be read by every practitioner at home and abroad, as he will be thereby better able to guard his patients against the patent food vendor, who is destroying the health and emptying the pockets of a credulous public, and to stem the influence of quackery, which tends to react deleteriously upon the character of the people of any nation. One means of obtaining "certificates of cure" Dr. Hutchison has not told us, it is this: An agent for a patent medicine finds out from a tradesman those of his customers who owe him money. He buys the bad debts for a small sum, proceeds to the houses of these customers and informs them that if they will take his medicine for a week, and at the end of the week state that the medicine has done them good or cured them, he will pay the bill they owe to the tradesmen. This method of obtaining evidence of cure needs no comment, but it is one which was told in the public press lately.

EXAMEN DE 43 CAS DE PALUDISME PROVENANT DE RÉGIONS TROPICALES (An Examination of 43 Cases of Malaria from Tropical Regions). By Surgeon-Major A. Billet, Chief of the Bacteriological Laboratory at the Military Hospital at Marseilles. Extract from the Minutes of the Societe de Biologie. (Meeting held on November 25th, 1905.)

During the year 1904-1905, Dr. Billet was able to make notes on 43 cases of malaria which came from the Tropics, viz., Madagascar, Tonkin, Senegal, Ivory Coast, and the Soudan. They were divided as follows:—

(1) *Primary tertian* ague, simple or double, characterised in all cases by small schizonts, annular, slightly or not at all pigmented, with crescents. Endogenous forms of multiplications rare or even absent in the circulation. Schüffner's dots scanty. (20 cases.)

(2) *Secondary tertian* ague (chronic), simple or double, characterised by large schizonts, amœboid, black pigment abundant, rounded gametes. Endogenous forms of multiplication, with from 16 to 20 merozoites. Schüffner's dots plentiful. (18 cases.)

(3) *Quartan* ague, characterised by pigmented schizonts, smaller than those of secondary tertian type, and by gametes, also rounded, but smaller. Segmentation forms show eight merozoites at most. No Schüffner's dots in the infected blood cells (5 cases).

According to Laveran both the small and the large forms belong to the same pathogenic agent. Dr. Billet verifies this assertion, inasmuch as it applies to the tertian type of ague, which is more commonly found in the French colonies generally; in fact, he quotes four cases where he was able to study the transformation of the small tertian parasitic rings into large pigmented parasites of the same type of malaria, which he designates as secondary ague.

He considers the parasite of quartan ague as belonging to a distinct species from that of tertian ague. He was only able to observe crescents in two authentic cases of quartan ague.

WITH THE ABYSSINIANS IN SOMALILAND. By Major J. Willes Jennings, R.A.M.C. (Hodder and Stoughton.)

Although in no sense a medical work, but a well-written and breezy book of travel, this book will be interesting to all our readers as a lively illustration of the evidences of the field of adventure and interest open to those who follow up the profession of medicine in tropical lands. Major Jennings was in medical charge of the little knot of British officers who were attached to the Abyssinian Army which co-operated with us against the much misnamed "Mad Mullah"; and his adventures make pleasant reading, and convey to the reader in excellent colloquial English a vivid idea of the country and its primitive inhabitants.

Those who have shared in similar expeditions will not be surprised to find Major Jennings devoting more of his time to veterinary surgery than to human

medicine, for the Abyssinian soldiers proved so healthy as to seldom require any other treatment than an occasional dose of male-fern, while the efficiency of the transport animals depended greatly on his scientific and devoted attention.

As might be expected, however, the book is by no means devoid of interesting medical observation. He notes, for example, how ill the fish-eating theory of the causation of leprosy fits in with the facts of the case in Abyssinia, where there are some 8,000 lepers who can rarely, if ever, have eaten fish, owing to the scarcity of the article in a country where "during the greater part of the year many of the wells do not contain water, much less fish." His remarks on the enormous practical sanitary value of tropical sunlight are also interesting, as he doubts if the inhabitants of the terribly insanitary Abyssinian towns could survive at all but for the "merciful dealings of a tropical sun, which can well-nigh convert the smell of a pole-cat into the aroma of a nosegay." His instance of the disappearance of cholera effected by removing troops from a warm, damp, shady site, to a bare, breezy, tropical plain, is most instructive. He notes, too, that the greater part of Abyssinia is practically free from malaria.

It is mainly, however, as a book of travel and adventure that the book is to be commended, and from this point of view it is one of the best that has appeared for some time.

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Correspondence.

THE REVIEW OF HUGGARD'S HANDBOOK OF CLIMATIC TREATMENT.

To the Editors of the JOURNAL OF TROPICAL MEDICINE.

SIRS,—While thanking you for the favourable notice of my *Handbook of Climatic Treatment* in your issue of January 15th, may I be allowed a word of comment?

The reviewer says "there are occasional errors, as, for example, the explanation of the comparative coldness of the upper layers of the atmosphere, which is said to be mainly due to the physical law of the expansion of gases." Now this law explains only the rather exceptional case of up-hill winds, but the absorption of heat from expansion under these circumstances would rapidly be replaced by the sun's rays, were it not for the true reason, which is the universal operation of the law of selective absorption. Air, whether dry or wet, is very transparent to short-wave rays, but absorbs the long, dark heat waves, such as are radiated by the ground, and therefore acts in the same way as the glass of a green-house, forming a sort of heat-trap. The more dense the atmosphere, the more efficient it is in this respect, and hence naturally the rarer upper regions, being less efficient heat-traps, do not trap as much heat.

"Moist air is a much better trap than dry air, but this does not affect the explanation, as under any circumstances

the upper layers would be to a greater or less extent cooler."

On going again through the literature touching the point, I find that the account given on pp. 17 and 18 of my book states and explains the facts with perfect accuracy, though in a very condensed form. The supposed "error" is the teaching to be found in every treatise on the subject. Loomis (*Treatise on Meteorology*, New York, 1892, p. 41), says: "This decrease of temperature as we rise above the earth's surface is mainly due to the expansion of the air." A. Buchan, in his *Introductory Text-Book of Meteorology* (1871, p. 76, paragraph 208); R. H. Scott in his *Elementary Meteorology* (4th ed., 1887, p. 213); F. Waldo in his *Modern Meteorology* (1893, pp. 208-216); Julius Hann in his *Lehrbuch der Meteorologie* (Leipzig, 1901, pp. 161 and 748-752); Wilhelm Trabert in his *Meteorologie und Klimatologie* (Leipzig und Wien, 1905, pp. 47-48), all give the same explanation.

The reviewer's "true reason, which is the universal operation of the law of selective absorption," explains, contrary to what the reviewer supposes, not the comparative coldness of the upper layers of the atmosphere, but only why the rate of cooling in the lower layers of the atmosphere is not determined wholly by the law of expansion of gases (Hann, *Handbuch der Klimatologie*, 2nd ed., 1897, vol. i., pp. 121 and 261; W. Trabert, *op. cit.*, pp. 21-22.)

In regard to very elementary facts I must confess I had not thought bibliographical references needful.

Through a printer's error a minus sign is omitted on page 47 of the book. The half sentence quoted should run: "the black-bulb thermometer registered 55·5°C., whilst at the same time the temperature of the snow in the shade was −5·6°C." The absence of the minus sign doubtless warrants the reviewer's supposition that the observer referred to the air over the snow instead of to the snow itself.

Trusting that you will be able to find space for this rather long comment,

I have the honour to be, sir,
Your obedient servant,
WILLIAM R. HUGGARD.

Davos Platz, January 4th, 1906.

[The criticism in question was based, as a matter of fact, on Hann's standard work, quoted by Dr. Huggard, and the following extract from Dr. Ward's excellent translation of Hann (p. 265), will be seen affords ample justification of the criticism :—

"*Causes of the vertical decrease of temperature.*—The facts of the vertical decrease of temperature have now been considered. It remains to give an explanation of them. It was noted at the close of the chapter on Solar Climate (Chapter VI.), that the storage of heat at the bottom of the atmosphere results from the peculiar behaviour of this atmosphere toward solar radiation. This process has been called *selective absorption*. The radiations of shorter wave-length, including the luminous rays, are less absorbed, but more scattered, while the radiations of greater wave-length—the invisible infra-red rays—suffer a greater selective absorption, and are to some extent altogether prevented from reaching the earth's surface. As solar radiation is very rich in rays of such wave-length as are readily transmitted by the atmosphere, a large proportion of this radiation is available for warming the earth's surface. On the other hand, the 'heat rays' which are emitted from the earth's surface are to a very considerable extent absorbed by the atmosphere, because this is non-luminous radiation, of long wave-length, in the extreme infra-red portion of the spectrum. Thus it is seen that the radiation from the sun passes to the earth's surface through the atmosphere more freely than the non-luminous radiation from the earth passes out again through the atmosphere. In this way, the atmosphere helps to store up heat at the earth's surface, and this process of storage is naturally most effective in the lower strata, which are the densest and contain the most impurities, and is least effective in the rare, dry, and clean air of greater altitudes.

"Therefore the thinner the atmospheric envelope, the less the effect of the atmosphere, and the lower the temperature of bodies within it, which are then exposed to a freer receipt and loss of radiant energy. The mean temperature of the air must be distinguished from that of the surface which the atmosphere protects. The air temperature decreases with increase of altitude, in spite of the increase in the intensity of solar radiation with the corresponding decrease in the vertical thickness of the absorbing envelope. Exception must be made, however, in the case of an elevated zone of incipient absorption, for which the vertical temperature gradient is nearly zero."

The remark as to the scantiness of bibliographical references referred to the book generally, and certainly not to its treatment of "elementary facts."]

THE REVIEWER.

DR. HARTINGTON'S ARTICLE ON FIT AND UNFIT PERSONS.

To the Editors of the JOURNAL OF TROPICAL MEDICINE.

SIRS,—It was with much surprise that I read in page 16 of your Journal, dated the 15th inst., in Dr. Hartigan's article "On Fit and Unfit Persons for Residence in Warm Climates," the following words, "I have purposely excluded the Reviera, having found its climate lowering, treacherous, and changeable, many of its popular resorts insanitary (in flies and smells they could favourably compete with 'Eastern Bazaars' or 'China towns'), whilst, when the mistral blows, the dust is most irritating to delicate throats and bronchi; the sun and sky give them their only advantage over our cloudy land."

This wholesale libel on a number of popular health resorts, both in France and Italy, ought not to pass unrefuted in the forthcoming numbers of your Journal.

I fear that your eminently useful and able periodical is not much read in the Reviera winter resorts, otherwise I am sure you would receive many a protest from the dozens of British doctors, who, like myself, come to this delightful climate year after year on account of its salubrity and other advantages.

As I have visited most of the coast towns between Marseilles and Genoa, and have resided also some years in Western India, I can safely assert that nowhere is there a Reviera town, frequented by invalids, that could, "in flies and smells, favourably compete with 'Eastern Bazaars,' or 'China towns'." Furthermore, I would say that as regards sanitation most of the Reviera health resorts would compare quite favourably with our British watering places. I do not pretend that every town on this coast is as sanitary as it might be. I have yet to meet the Medical Officer of Health in our own land who is fully satisfied with the sanitation of his district.

The thousands of elderly persons and invalids that come out every season to the brightness and beauty of this coast, thereby loudly attest to the advantages they derive from being free from fogs, frosts, and other failings of our less favoured land. Is it likely that these visitors to the sunny south would banish themselves from their homes and friends, incurring thereby no small expense, if, as Dr. Hartigan says, the climate was lowering, treacherous, and changeable ?

No one is likely to find a perfect winter climate, but for accessibility from Great Britain, for salubrity, warmth, and many other advantages, I know of none equal to that of the Riviera, and I often flatter myself that I have chosen one of the best of the North Mediterranean resorts.

I know something of most of the chief resorts of Italy and Sicily, but have found no climate equal to that of San Remo.

I could add much more, but forbear to burden your columns any further.

I am, &c.,
W. SOLTAU ECCLES.

Hotel Bel Sito, San Remo, Italy.
January 31*st*, 1906.

ZAMBESI ULCER.

TO THE EDITORS OF THE "JOURNAL OF TROPICAL MEDICINE."

SIRS,—Having just started to read an accumulation of your Journals, I now notice under "Zambesi Ulcer," by Z. E. Ashley-Emile, in the number of September 15th, 1905, a description of common ulcers of the leg, met with in Southern Tropical Africa, of which the writer claims to have discovered the cause in the following words among others, *viz.*, "I may, then, lay claim to the unique distinction of being first in the field in bringing to notice the cause of these ulcers, which has hitherto remained in obscurity, and evaded elucidation by many eminent observers in tropical medicine who have resided in Zambesia." So far as I can recall, the only eminent observers who have resided in that part of the world were the members of the Royal Society's Commission on Blackwater Fever, and it is not likely that they paid any particular attention to this question. The writer may have been the first to describe these ulcers, I don't know, but as to a larva not being known to be a cause of some of these ulcers, and that the point had hitherto remained in obscurity, I must say that I think he has not a wide experience of that part of Central Africa, and of the medical men there. The attacks of this larva are well-known to all, and Europeans frequently get their boys to extract them. I have been asked to extract one from the glans penis. I have a specimen I mounted on a slide, north of Lake Nyassa, over five years ago, and among those who have seen it are Professor (now Sir John) MacFadyean. At the same time I got a native to catch some of the parent fly, and kept a dozen of them in paper for two years, but when I reached England they were too much damaged to be of any use for identification. The common sites for Europeans to be attacked are the various parts of the trunk, and I have taken them from the back of the hand. They are believed to adhere to clothes that have been dried on the grass. I thought it more than likely that specimens of these larvæ had been taken home to the Tropical School by such men as Dr. Daniels. The larva appears to resemble the one the writer quotes as described by Blanchard, and as he has not proved that it is not identical, how can he claim to have discovered it?

The advice with reference to boots, leggings, long grass and houses is unpractical and would not be followed; men desire comfort and convenience in these matters at home, and a sportsman cannot avoid long grass; besides, the larva is not such a pest as to require disinfection of the floors.

Finally, I do not think that the majority of ulcers in the situation he describes are started by this larva; natives will generally say they were caused by a knock from a tree-stump. Common ulcers of the legs in Europeans have also been known as "fever sores"; some microscopical work is required on the subject.

I am, Sirs,
Your obedient servant,
J. E. S. OLD, M.R.C.S.Eng.

Aden, February 1st, 1906.

BERI-BERI IN SYLHET, ASSAM.—During the last week of October, 1905, cases of beri-beri occurred in the Sylhet Gaol, and by November 8th 100 cases had occurred with 8 deaths. The deaths are stated to have occurred amongst those of the convicts engaged at the oil mills, which are said to be insanitary. A more liberal diet and improved hygienic environment lessened the number of cases.

EXCHANGES.

Annali di Medicina Navale. Annali d' Igiene Sperimentale Archiv für Schiffs u. Tropen Hygiene. Archives de Médicine Navale. Archives Russes de Pathologie, de Médec. Clinique et de Bacteriologie. Australasian Medical Gazette. Boletin de Medicina Naval. Boston Medical and Surgical Journal. Bristol Medico-Chirurgical Journal. British and Colonial Druggist. British Journal of Dermatology. British Medical Journal. Brooklyn Medical Journal. Caducée. Clinical Journal. Clinical Review. Giornale Medico del R. Esercito. Hong Kong Telegraph. Il Policlinico. Indian Medical Gazette. Indian Medical Record. Indian Public Health. Interstate Medical Journal. Jahresbericht. Janus. Journal of the Royal Army Medical Corps. Journal of Balneology and Climatology. Journal of Laryngology and Otology. Journal of the American Medical Association. Journal of Experimental Medicine. La Grece Medicale. Lancet. Liverpool Medico-Chirurgical Journal. London and China Express. Medical Brief. Medical Missionary Journal. Medical Record. Medical Review. Merck's Archives. New York Medical Journal. New York Post Graduate. Pacific Medical Journal. Philippine Journal of Science. Polyclinic. Revista de Medicina Tropical. Revista Medica de S. Paulo. Sei-i-Kwai Medical Journal. The Hospital. The Northumberland and Durham Medical Journal. Transactions of the American Microscopical Society. Treatment. West India Committee Circular. West Africa.

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Original Communications.

TICK FEVER.

By Philip Ross, M.D.

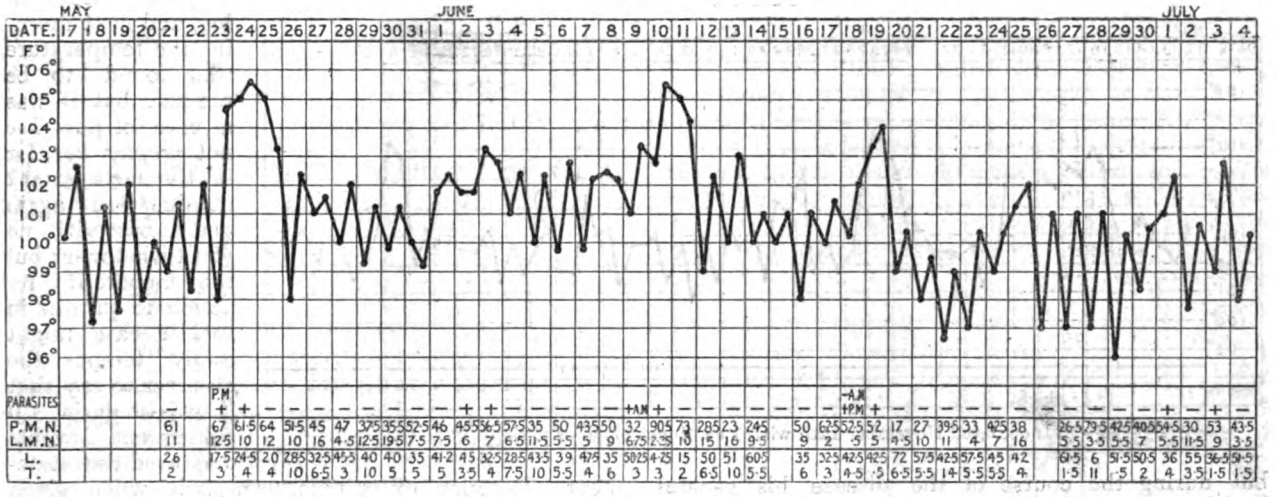
Definition.—Tick fever of Uganda is a specific fever due to the presence of a spirochæte in the general circulation. This spirochæte is conveyed by the bite of a tick (*Ornithodorus*), but is also communicable by inoculation with infected blood.

History.—Fever due to the bite of a tick, *Argas moubata*, probably an ornithodorus, was first described by Dr. Livingstone. Since this description there seems to have been very little written on the subject. Manson, in his "Tropical Diseases" (1), quotes from Sir John Kirk, and from letters from Dowson and Daniels. More recently Christie suggested that the disease might be due to *Filaria perstans*, inoculated by the bite of an ornithodorus, but the general opinion, as shown by the discussion following a paper by Nuttall at the Epidemiological Society towards the end of 1904, seems to have been that the disease was probably a piroplasmosis. Towards the end of 1903 I found spirochætæ in a case of fever under the care of Dr. Hodges at Entebbe (2), and succeeded in infecting a monkey from this case. Within a few weeks Cook, of the C.M.S. Hospital, Mengo, also found spirochætæ in a fever patient. This latter writer had probably seen but not recognised the organism some two years before.

Nuttall had previously suggested that the spirochæte of relapsing fever might be conveyed by such insects as bed-bugs, and in September, 1903, Marchoux and Salimbeni (3) described the spirillosis of fowls common in Rio de Janeiro, and, further, showed that the disease was conveyed by a tick (*Argas*). On reading this paper it occurred to me that perhaps the spirillosis we had found to be so common in Entebbe was nothing else but tick fever. An opportunity of testing this theory soon occurred, when Milne arrived from Hoima, bringing with him blood slides from eight cases of fever, ascribed by the patients to the bites of ticks. These ticks Milne had already had classified by Theobald as *Ornithodorus Savignyi*, Audouin, var. *cæca*, Neumann (?*Argas moubata*, Murray). On hearing of the possible connection between this disease and spirillosis, Milne most generously handed over all his slides to me for examination, and in every one spirochætæ were found. Some two months after the publication of the paper by Milne and myself (4), Dutton and Todd (5) telegraphed from the Congo that they had succeeded in infecting monkeys with spirillosis by the bite of naturally infected ticks (*Ornithodorus*), and the postscript to Dutton's last letter announced that he had infected monkeys by feeding newly hatched ticks on them, thus proving the hereditary transmission from parent tick to offspring through the egg.

The most recent work on the subject of spirillosis is contained in the paper by Borrel and Marchoux (6), who show that at 35° C. the spirochætæ of fowls develop in the body of the tick, which latter suffers from a true spirillosis. At 18 to 20° C. the parasite does not develop, but even after months of starvation, exposure to the higher temperature will cause the increase of the parasite and consequent infectivity of the tick.

Chart I.



Note.—The sign − = No parasites found in blood.
\+ = Many ,, ,, ,,
+. = Few ,, ,, ,,
+.. = Very few ,, ,, ,,
+, = One parasite ,, ,,

P.M.N. = Polymorphonuclear leucocytes.
L.M.N. = Large mononuclear ,,
L. = Lymphocytes.
T. = Transitional.

Monkey, No. 34.—Inoculated 1 cc. finger-blood from patient during first relapse, May 17th, 11 a.m. Incubation period, 6 days. Intervals (1) 8 days; (2) 5 days; (3) 7 days; (4) 11 days; (5) 1 day. Differential count May 7th, *i.e.*, before inoculation: P.M.N. 20·5; L.M.N. 19; L. 56; T. 5·5.

The Disease.

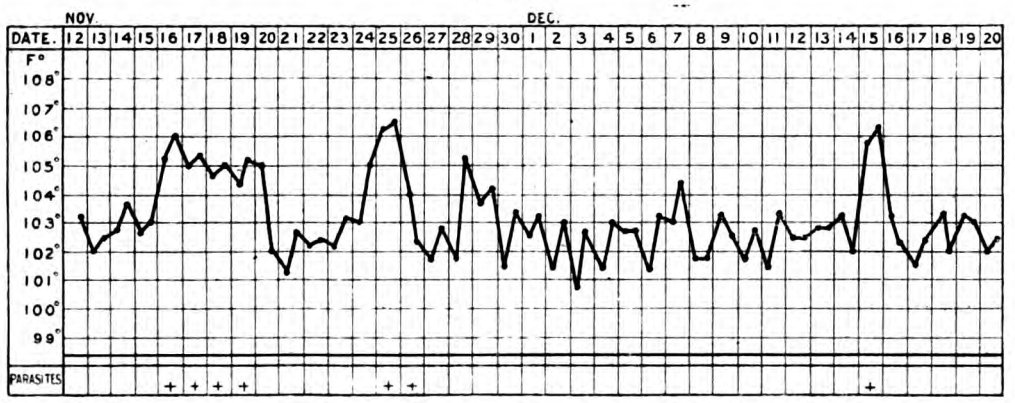
Incubation Period.—The incubation period seems to be from two or three to eight days. The periods of one day given by some natives are probably wrong, and are only the interval since the patient observed

that he was last bitten. As will be seen later, the incubation period in the inoculated disease varies between two and six days.

Onset.—The onset is usually rather abrupt. The patient may complain of not feeling quite well, his temperature is found to be rising, and in a few hours he is prostrate with all the symptoms of the disease.

Symptoms.—In the European the symptoms are fever, headache and vomiting. The temperature rises to 103° to 105°, there is intense headache, sometimes pains in the back or limbs, and most obstinate vomiting. These symptoms last for a varying time; as a rule from twenty-four to forty-eight hours, although they may continue for several days. The temperature then falls suddenly to normal, and all the symptoms are relieved. After an interval of varying length, usually about four or five days, there is a recrudescence of all the symptoms. These relapses may occur four or five times, but have a tendency to become of shorter duration. When at last the relapses cease the patient passes into a fairly rapid convalescence, but during the course of the disease his general health gets very poor and he loses a good deal of weight.

CHART I*a*.



Inoculated November 12th with 1 cc. finger-blood of patient.

In the native, relapses do not always occur, and as a rule there is not more than one relapse. In one of Dr. Hodges' native cases, at the time when a relapse might have been expected, I found the parasite in the blood, although the temperature remained normal and the patient's only complaint was of severe headache. Headache and pains are marked symptoms, and vomiting is more common than in malaria.

Slight hepatic and splenic enlargement may be observed.

Course of the Disease.—In the European there are usually four to six relapses, followed by recovery. In the native there may be no relapse. Death is very rare, and seems only to occur in those whose resistance has been lowered by lack of food, exposure or over-exertion. When it occurs there is a fall of temperature to or below normal, and the patient dies comatose.

Diagnosis.—The diagnosis can only be made with certainty by the discovery of the spirochæte in the blood. The parasites are usually exceedingly sparse in the blood, and it may take many hours' search to find one organism.

The most difficult disease from which to distinguish tick fever is malaria. It is hardly possible to do so by the symptoms alone. If the patient has had malaria recently, his blood may show pigmented leucocytes, and the observer will be apt to content himself with finding these and to put down the case as malarial, but it may be said that a marked rise of temperature in malaria is always accompanied by the presence of parasites in the peripheral blood. There may be very rare exceptions, but personally I have never seen a case of malarial pyrexia where half to one hour's search did not reveal the presence of parasites, unless, of course, the patient had taken large doses of quinine. The reaction to quinine may be a useful point in helping to separate the two diseases. Quinine has absolutely no effect on the temperature or course of the disease in tick fever, but where the reaction is relied on a mistake may easily occur, especially in the initial attack. I have seen a case where the patient was given a large dose of quinine one evening, and next morning the temperature was found to be normal, but it was a case of *post hoc* not *propter hoc*, for in the next attack quinine was again given, but with no effect whatever; but the apparent reaction to quinine in such a case might easily tempt the observer to say that it was malaria, till subsequent events disproved the statement. Reaction to quinine, especially when given by intramuscular injection, would prove the case to be malarial, if this fallacy could be excluded. A European who reacted to quinine and who continued free from fever afterwards while taking quinine would naturally be set down as having suffered from malaria, but a similar course of events in a native would prove nothing. Later in the disease in Europeans, the temperature chart is very characteristic, but it is of some considerable importance to make the diagnosis during the initial attack, as if this be not done, the patient will probably ply himself or be plied with quinine, which is quite useless, and only adds further discomforts to his already miserable state.

Hodges lays stress on the facts that in the native vomiting is more common, and the pains more marked and more complained of in tick fever than in malaria.

Where the blood examination has failed the diagnosis can be made with ease and certainty by injecting a drop or two of the patient's finger blood into a monkey. When the animal sickens the spirochætæ can be found with the greatest ease in its blood. But this method takes a few days.

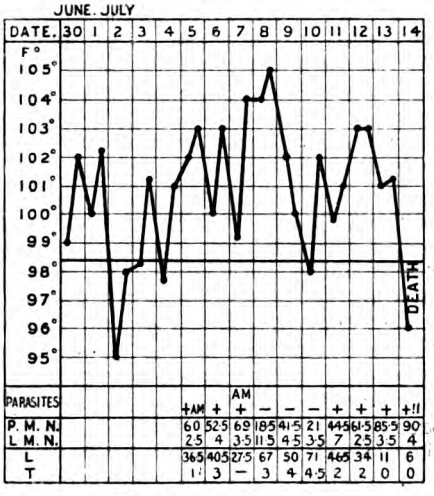
The blood examination will show a relative increase of polymorphonuclear leucocytes. There may also be an increase of large mononuclears, but this latter is of little value in malarial countries.

To sum up, the diagnosis can only be made with certainty by the examination of the blood. The leucocyte count may perhaps give the right clue, and the lack of reaction to quinine may exclude malaria.

Staining.—Leishman's stain is perhaps as convenient as any, and has the advantage over some other stains in that it permits a leucocyte count to be made. Actually the best stain for the parasite is dilute (1 in 3) aniline-gentian-violet for three or five minutes in alcohol or alcohol and ether.

Inoculation.—If a monkey is to be infected the finger-blood may be drawn up into a hypodermic

CHART II.



MONKEY No. 43.—June 30th, inoculated 1 cc. finger-blood from monkey No. 39. Incubation 4½ to 5 days. Duration of first attack, 3 days; interval, 3 days. Duration second attack, 4 days. On fourth morning found prostrate, temperature subnormal, blood swarming with parasites. Death.

Fowl and dog inoculated with 5 cc. heart-blood, but showed no reaction, and no parasites could be found.

Post Mortem.—Lungs, a few very small infarcts. Heart, a few very small infarcts. Spleen rather large, firm, infarcts on surface. Liver rather large, congested, infarcts on surface. Kidneys congested. Lymph glands uniformly enlarged, some of them hæmorrhagic. Brain a little surface congestion, no infarcts.

syringe in which there has been placed a drop or two of a 1 per cent. solution of potassium citrate. The mixrtue is injected subcutaneously.

Treatment.—No drug seems to have any effect either in shortening the disease or relieving the symptoms. All that can be done is to feed the patient in the intervals between the relapse. If a febrile period is prolonged it may be necessary to have recourse to rectal feeding. When convalescence sets in the patient may be given some ordinary tonic, and should be ordered rest and good food.

Prevention.—Prevention is easy for Europeans, but becomes difficult when dealing with natives. The ornithodorus lives by day in the thatch or in cracks of mud floors and walls of old native huts. At night it comes out in search of food, retiring again when it has fed.

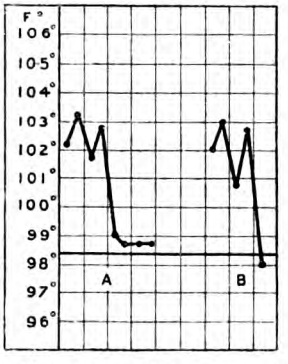
In a country where tick fever is known to exist old camping grounds should be avoided, and native porters and boys should be warned not to use old huts to sleep in. Huts known to be infected should be burned. Europeans will be practically protected by their mosquito nets, provided these be arranged so that they can be tucked in beneath the bed-clothes. Nets with shot-weighted edges to drop to the floor are more likely to be a help to than a protection against the ticks.

It is possible that the reason why natives do not suffer from relapses as do Europeans is connected with their house arrangements. A native living in an infected hut will be constantly subject to reinfection. If, as in other spirilloses, the immunity conferred be only temporary, the native when recovered from one attack will be immune for some time. As the immunity becomes less he will be liable to fresh infection, but it seems likely that the previous attack will have increased his resistance to the disease, and may thus be the cause of the absence of relapses.

THE EXPERIMENTAL DISEASE.

The subcutaneous inoculation of a drop or two of blood from the finger of a patient during fever into a monkey (black-faced or Sykes' Cercopithecus, or Cynocephalus) is sufficient to produce a disease exactly resembling the disease as seen in Europeans. After an incubation period of from two to six days the monkey's temperature rises to 104° to 106°, the animal is found sitting about resting its head

CHART III.



A. Disease in native. Recovery.
B. Disease in native. Death.

on its hands or against the wall of the cage, and evidently feels very ill. In a typical case, after a variable time, usually two to four days, the temperature, which during this time has remained high, falls abruptly to normal, and the animal appears quite well. In five or six days there is again a rise to 104° to 106°, lasting, as a rule, a couple of days, then falling as before. As in the European, there cannot be said to be any regularity either in the duration of the febrile period or in the length of the interval. The fever may persist for nearly a week or last but a day, and the intervals vary between one and eighteen days, but in the later relapses there is a tendency for the

febrile period to be shorter and for the temperature not to rise so high. The animal also is not so evidently ill as during the earlier attacks.

Blood Examination.—If the blood of a monkey be examined when the temperature is first found to be rising it will be found to be swarming with spirochætæ. These are rarely found single, but when so found they are twisted and contorted to a degree not seen in the regular wavy organism seen in man. Usually they are in tangled masses of from four or six to many hundred individuals. Division forms are fairly common. In the fresh blood specimen the parasites are as a rule hard to find in man, but in the monkey they are present in such quantities as to be easily made out. If a single organism can be seen when temporarily arrested in its course its movement resembles nothing so much as that of an archimedean drill. When free it moves much too rapidly for the observer to gather any very clear idea as to its movement. The disturbance of red cells is slight, much less than that caused by a trypanosoma or filaria.

The organisms can easily be found till the crisis, when they disappear even more suddenly than they appeared. In the later relapses the parasites are present in less number than in the earlier attacks, but their behaviour is similar in all respects.

After the first day or two of fever nucleated red cells are found in fair numbers. They persist in the blood till the termination of the illness, and a few may still be found some weeks after the last relapse.

Leucocyte Count.—After inoculation there appears a gradual rise of the polymorphonuclear leucocytes. When the attack sets in there is rather a marked leucocytosis, with a large relative increase of the polymorphonuclear cells at the expense of the lymphocytes. This leucocytosis persists till the crisis, and may become extreme just before the crisis, every microscopic field showing large numbers of leucocytes, especially of the polymorphonuclears. Immediately after the crisis there is a sudden reversion to the original leucocyte count, and this persists till the relapse. A point of interest is that in the later stages of the disease it is sometimes found that the polymorphonuclear increase occurs, although there is no rise of temperature. In two of such cases I have found that long search through a slide has shown the presence of a very small number of spirochætæ. I am inclined to think that in such cases there has really been a relapse, but that it has been so slight that the resistance of the patient being increased by previous attacks, so far as the temperature is concerned, it has proved abortive. Such an attack would probably be comparable to Hodges' case, referred to above, where the parasite appeared in the blood without any rise of temperature, the only sign of relapse being the severe headache.

The mechanism of the crisis in spirillosis has been much discussed, especially by the French working with the parasites of relapsing fever, and of fowls and of geese. Metchnikoff (7) and Cantacuzène (8) are of the opinion that the phagocytes are the agents of the crisis—in relapsing fever the polymorphonuclears, in spirillosis of geese, the macrophages of the spleen. Gabritschewsky (9), on the other hand, ascribes the crisis to the formation of bacteriolysins in the blood serum. Working with the Brazilian disease, Levaditi (10) concludes that in refractory animals the formation of antibodies takes place in the leucopoietic organs, especially in the spleen, bone-marrow, and lymph glands, and the leucocytes should be considered as the principal if not the exclusive source of the antibodies. But in animals suffering from the disease he concludes that "la disparition les spirilles pendant la crise, ne saurait reconnaître l'intervention d'une sensibilisatrice spécifique, considerée comme agent bactériolytique"; and further, "les observations faites sur la septicémie de Marchoux et Salimbeni sont ainsi d'accord avec les constatations de Metchnikoff et de Cantacuzène concernant la fièvre récurrente et la spirillose des oies, pour accorder aux leucocytes une influence de premier ordre dans la guérison spontanée des animaux." The phenomena seen in the Uganda disease would appear to bear out the importance of the part played by the leucocytes. The polymorphonuclear leucocytosis coincides with the appearance of the parasites in the blood, and ends at the crisis which coincides with their disappearance. In both polymorphonuclear and large mononuclear leucocytes clear spaces can be seen, and sometimes, though rarely in the peripheral blood, this space is seen to contain a parasite. In smears of organs after death, especially in smears from the liver and lung, this appearance of parasites, engulphed by the leucocytes, is exceedingly common. After the crisis the vacuoles can still be seen in the large mononuclears, but not in the polymorphonuclears. Where the crisis is due to the formation of bacteriolysins one would expect that the parasites would show loss of motility, signs of degeneration, as shown by change of staining reaction and diminution of numbers. No one of these phenomena is, however, observed.

A marked feature in blood taken during the febrile period is the appearance of the polymorphonuclear leucocytes. Many of these appear to have been so damaged that the mere act of spreading the film converts them into an indefinite mass of nuclear material and granules. In others whose outline is still distinct, there is a marked rearrangement of the nucleus; instead of being rather compact in the centre of the cell, it tends to arrange itself peripherally, leaving a granular space in the middle of the leucocyte. The outline of such cell is much less definite than that of the normal cell.

Death.—Death usually takes place during an early relapse. The temperature of the monkey falls below normal, but the animal does not show the expected improvement. A blood slide taken now will show swarms of spirochætæ, and an enormous leucocytosis. The animal becomes comatose and dies in the course of a few hours.

Post mortem.—The changes found after death are slight.

The lungs show small infarction areas.

The liver is rather large and congested.

The splenic enlargement is slight, and the splenic substance is firm and not at all friable.

The lymph glands are enlarged and some of them are hæmorrhagic.

The brain shows no change.

The heart shows petechiæ in its wall.

Smears of the organs show most parasites in liver,

lung and kidney, and fewest in spleen, brain and lymph glands.

There cannot be said to be anything characteristic in the *post-mortem* appearances in the monkey, any more than there is in man.

It is only recently that I was able to attempt experiments with the ticks. After Dutton and Todd's results in the Congo, I was surprised that the experiments failed, but Borel and Marchoux offer a ready explanation of this in their paper. If the spirochæte does not develop in the tick at 18° to 20° C., it is probable that the tick brought from the moist warmth of Uganda to the cool days and cold nights of Nairobi ceases to be infective, and I expect to have to use the incubator to get any results.

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NOTES FROM NORTH NIGERIA.

Liver Abscess, Filaria, Cerebro-spinal Fever, Bilharzia, Spirillar Fever.

By Dr. David Alexander.

[The following is abstracted from a letter dated December 9th, 1905, sent by Dr. Alexander to Dr. Andrew Davidson, Lecturer in Tropical Diseases, University of Edinburgh, to whom we are indebted for forwarding the communication.—Ed., *J.T.M.*]

It may interest you to know, although it has not been published yet, that a friend of mine who has been doing special work in connection with amœbæ, their cultivation and relation to liver abscess, has been able to cultivate them, and has produced liver abscess; this, no doubt, will appear in print soon, unless he discovers some fallacy.

None of the subjects in whom I found *F. perstans* had any illness that could be traced to it, but then consider the number of those who have *F. nocturna* that have no illness either. All the cases I found *F. perstans* in had been in Ashantee: so far I have not got it in any local native yet.

I am surprised that there has been no appearance in print yet of the Principal Medical Officer's report on the cerebro-spinal epidemic. It is endemic and epidemic apparently all over West Nigeria, although I am told that there are no cases up here. At Kano there were a great many cases; deaths include one white man. Kano is 100 miles from here on the one side, and at Sokoto on the other side there were also cases. They also had the epidemic at Yola, so it was present at both extremities of the Protectorate. The natives connect it, somehow, with small-pox, and say that when small-pox is not bad, it is bad. It appears towards the end of the dry season—February, March, and April—and ends with the first rains. None of the attendants that we employed got it, and cases in a town were very irregular in their occurrence; one case here, and the next in a house perhaps 600 to 800 yards away. I never saw a case at home, but it exactly tallies with the description in the text-books. Some of the cases I was inclined to look on as epidemic pneumonia, but probably I was wrong; anyway, we had no differential stains.

Bilharzia I have not come across yet, but that it exists in West Nigeria is certain. Dr. Watson, who made one or two tours in Bornu, tells me he saw it there. (That is Watson of the new *Amphistomum Watsonii.*) Mosquitoes there are many; I have not done much in the way of identification of them.

Spirillar fever I am on the look out for; the ornithodorus is here, and possibly I may have a case. I make a habit of staining a slide from nearly every fever case with carbol-fuchsin, on the off chance of spirilla.

In a note of later date, Dr. Alexander adds:—

I ought not to have said the ornithodorus is here. I described what I wanted to a rather intelligent native, and he said that he knew what I meant, but to-day he brings me in the ordinary bed-bug. However, I may get it yet.

"Indian Med. Gazette," February, 1906.

Prevalence of Yaws in the Chinduin District of Upper Burmah.

Military Assistant Surgeon, P. A. McCarthy recalls that the presence of yaws in this district was first noted by Mr. A. A. Nolan in the *British Medical Journal*, February 2nd, 1895. The disease is known by different names in different townships, some speaking of it as leprosy, and others by descriptive names, such as "crippling disease," "molehill disease," and so on. This variety of names certainly appears to indicate a recent origin, and there is a tradition that it was introduced from Siam *via* the Mergui coast and Chindwin River, and the fact that it is rarely found in inland villages would appear to support the tradition. He considers that the mode of communication is usually by direct inoculation of some breach of surface, and met with it at all ages, from three months to three-score years.

The period of inoculation, though uncertain, he considers to be about three to eight weeks. The author then describes the lesions and course of the disease, which certainly appear to support his opinion as to the identity of the disease with that known as "yaws" in other parts of the world.

He gives some interesting information as to the method of treatment adopted by the native practitioners, or *sayahs*, who employ crude mercury, and occasionally red arsenic. Mr. McCarthy himself used a mixture of hyd. perchlor. and pot. iod. in the secondary stage, and soda lotion, and occasionally sulphate of copper, to the granulomata locally.

In a letter to the editor of the same journal, Lieut.-Col. W. A. Lee, I.M.S., referring to Major Childe's paper on the occurrence of Leishman-Donovan infection in Europeans, states that, unlike Childe, he finds the disease by no means uncommon in Europeans in certain parts of the town of Madras, and draws attention "to the value of carbolic acid, which should be given for a prolonged period, and in gradually increasing doses, to the utmost limits of tolerance." Some of his cases received "as much as 3 drachms daily, with ultimately beneficial results, and without any drawback, such as carboluria, occurring."

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THE

Journal of Tropical Medicine

MARCH 1, 1906.

THE DEPRECIATION OF THE ATTRACTIONS OF THE INDIAN MEDICAL SERVICE AND ITS REMEDIES.

II.

IN our first article on this subject we drew attention to two causes of dissatisfaction, viz., to the want of encouragement to professional zeal and research, and to the hardships of the superannuation rules, which render it practically impossible for any man who has devoted an adequate time to his student career to reach administrative rank. In the present, we propose to touch on a matter which, though of mainly sentimental interest to the individual members of the Service, is of vast practical importance to the State, as it lies at the very root of the inefficiency of Indian sanitary reform, and in many other directions impairs the efficiency of our medical institutions. We allude to the lack of proper status and influence in the councils of the Indian Empire. Politically speaking, the Surgeon-General with the Government of India is a sort of expert adviser to the Secretary to Government in the Home Department, and when matters of sanitary and medical import have to be dealt with, the latter official may or may not ask medical advice, and, in either case, is perfectly at liberty to ignore it, and probably as often does so as not. Owing to this the position of the Surgeon-General is most unenviable; for the general public, knowing nothing of the gearing of the bureaucratic motor, naturally imputes any blunders that may be committed to him, though they may in reality have been made in defiance of his strongest protests, while official etiquette renders it impossible to utter a word to clear his professional reputation. Nothing can better illustrate the powerlessness of the medical service in the direction of sanitary affairs than the history of the methods of the Indian Government in dealing with plague, of which the following is a short sketch. It may be admitted that the most recent pronouncement of the Simla secretariat on the subject, which we reproduce in another column, is by far the most satisfactory that has been hitherto issued by that august body. One might, in reading it, almost imagine that Simla had taken medical advice on the subject, instead of treating their medical experts as persons most of all likely to take an ignorant and prejudiced view of the question; for hitherto the ways of the Indian Government in the campaign against plague have generally appeared to be based rather on shortsighted notions of expediency than on what might be expected to be the views of their sanitary advisers.

The history of plague prevention in India, however, has been one long series of blunders and mistakes of a sort that could hardly have been committed had the sanitary authorities been trusted to make their own arrangements.

No doubt, at the time of the importation of the disease, the medical profession in India knew practically nothing of plague, but it had had ample experience in dealing with other epidemic diseases, and its intimate personal relations with the native population made it better qualified than perhaps any other branch of the public service to judge what measures would command the loyal co-operation of the people and what would irretrievably offend its prejudices.

As the fact was well known to all epidemiologists that all forms of inland quarantine had hitherto proved powerless to arrest disease of any kind, and as no one understood the ultra-sacredness of the Indian home better than the members of the medical service, it is hardly likely that it can be held responsible for such costly absurdities as sanitary cordons, and train inspections; or for the tactless folly of house-to-house inspection carried out by European soldiers, literally at the point of the bayonet.

The first step in this melancholy tale of misdirection was the ostrich-like one of trying to ignore the presence of the disease in Bombay; and in this way the critical days were wasted, during which stringent measures of isolation and disinfection might possibly have arrested the further spread of the disease. It required no special knowledge of plague to suggest such measures as are required at this stage of an epidemic, as they are self-evident, and have since averted invasion in many parts of the world.

The disease now spread rapidly, and the Government, becoming frightened, attempted to "stamp out" the disease. To this end a Commission, vested with extraordinary powers, was appointed; directed, not as might be expected, by a sanitary officer of proved experience, but by a combatant military officer, who, it may be incidentally remarked, has since proved none too competent, even in his own profession.

Of this Commission the medical officers were simply the agents and subordinates, and its proceedings were of so outrageous a character that, looking back on the time, it is surprising that murder and riot were not even worse aroused than was actually the case; for as if to accentuate its folly the Indian Government appointed, not an officer of the Indian Staff Corps, but one of the British Service who could not by any possibility be acquainted with native prejudices and ideas.

An officer who had grown grey in the sanitary department, who passed through Bombay at this period, remarked at the time to the writer, that he would have lost all respect for the natives of India had they not broken out into riot under the provocation they were receiving.

The mischief wrought by this outburst of mad militarism has been irreparable, as all subsequent measures of the Government, good, bad and indifferent, have been viewed with such suspicion by the native population that it has been impossible to obtain their co-operation, even where they have not resorted to active or passive opposition.

Terrified by the storm it had raised, Government rushed to the opposite extreme, and instead of trusting to the individual tact of its officers to do the little that it had left possible, tied their hands by minute and stringent regulations. To save its face the portentious farce of train inspections was now paraded as the principal line of defence. The medical officers employed on this duty were supposed to examine several hundred people during a halt of fifteen or twenty minutes, and in order to avoid arousing further ebulitions of violence, were, moreover, forbidden to make any sufficient physical examination.

Assuming the patient to be still able to stand, it was in the last degree unlikely that a case could be detected.

Anything more hopelessly futile and harassing than the duties thus thrown on the medical officers employed on the work it would be hard to conceive, and it is probable they were the only people who were more disgusted with the folly of the system than the unfortunate passengers (native and European) who were worried every hundred miles or so by their obviously useless inspections.

Another vagary of this period, born of the desire to appear to be doing something, was the order of a provincial government, that in the chief town of each district every house should be inspected by the Civil Surgeon. The cubic space of each room was to be measured and sanitary recommendations made to each householder. Several of these towns possessed over 25,000 houses, and probably none had less than 3,000 or 4,000, so that the impossibility of a single man, already busy with a multiplicity of duties, carrying out such a task in any reasonable time, even in the smallest places, is sufficiently obvious. As a matter of fact, nothing but rebuilding could convert these oriental houses into sanitary dwellings, and the Government, even if unable to understand this, must have been perfectly aware that nothing whatever would come of the Civil Surgeon's recommendations. What the secretariat evidently did not understand, however, was that the circular, if taken literally by the medical executive, could scarcely fail to cause opposition and rioting. Fortunately, there was hardly an officer in the provincial medical service who had not the tact to practically ignore the order, for every one knew that a broken head and an official reprimand for want of tact was all they were likely to earn by taking seriously such a piece of buffoonery. In one great town, however, it was so obvious, even to the wiseacres at the helm, that the job was more than one man's work, that he was given a couple of youngsters fresh from home to help him in the task. Presumably these energetic recruits must have been so inexperienced as to believe that Government orders should always be taken *au grand sérieux*, for the result was serious opposition, and it was even whispered, disaffection in a native cavalry regiment, though the rumour may be doubted.

Then urgent telegrams went flying over the country, "Cease house-to-house visitation at once." There was probably not a district medical officer in the province who, if asked his opinion, would not have told the authorities that, apart from its futility, such an order was in the last degree impolitic, and it is most unlikely that the very able man who was nominally the administrative medical officer differed from his colleagues on the point. What he may have thought, however, matters nothing, for in any case his powers, whether of action or protest, were practically *nil*.

It would occupy too much space to give a complete history of the later developments of the campaign, beyond saying that of late years the policy has simply been to "let things slide," but enough has been written to show that the course of action has not been what would be expected of men accustomed to deal with epidemic disease in any form, or of officers who in any way understood what sanitary measures are, and are not practicable in dealing with a population whose prejudices are as peculiar as that of India. To thoroughly understand the caste system would probably occupy the lifetime of several German professors, but in the course of fifteen or twenty years' work a sanitary officer attains a fair working knowledge of how to get the maximum possible, under the circumstances, of sanitary effort, and it is the systematic ignoring of this invaluable source of strength that is responsible for the hopeless fiasco that we have attempted to describe.

The old caution of *ne sutor ultra crepidam* is as applicable to attempts on the part of the civil and military executive to deal with sanitary matters as to the cobbler's criticism of the artist. It is not for a moment pretended that the Indian sanitary officials, even if placed in authority, could have succeeded in arresting the advance of the pestilence, but it is certain that no one accustomed to dealing with the native population when attacked by epidemic diseases would have been guilty of the follies that have been described. At least the lacs of rupees

wasted, or hopeless attempts at inland quarantine train inspections, and similar expedients, would have been saved, and we may be sure that coercion would have figured but little in the programme, and if employed at all would have been confined to enforcing the evacuation of infected sites in cases where local circumstances rendered such a measure practicable.

In this way the road would have been smoothed for more effectual measures, when advancing knowledge indicates more promising lines of defence. The remedy lies in giving the Surgeon-General with the Government of India a seat on the Vice-regal Council, and the Inspectors-General of Civil Hospitals one on the Provincial Governments.

It is to be feared, however, that the Indian Government hardly desires to place its sanitary advisers in a position of proper trust and authority, as it is haunted by the fear that this would lead to what they would regard as undue expenditure on sanitary projects.

In reality it would be more likely to result in considerable saving, as no men know better how little can really be done in the present state of civilisation of the indigenous population.

Formerly the Director-General was entitled the "Sanitary Commissioner and Surgeon-General with the Government of India"; but a few months back a great flourish of trumpets was indulged in over the separation of the officers and the appointment of a separate Sanitary Commissioner. In reality, however, the step was a retrograde one, for by a subtle turn of policy the appointment was laid open by "selection" to any grade of the service, and the Government selected a quite junior officer, who, moreover, had had no practical experience whatever in the work of the Sanitary Department, but had been employed for the most of his service in a secretarial post. It is absurd to suppose that so junior an official, however able, could possibly carry sufficient weight to enforce his opinions on a body of veteran "big-wigs" such as constitutes the hierarachy of Simla, and the selection is really an evidence that the latter had no desire to find a medical Kitchener amongst them. A seat on the Council would, however, enable the holder to show that medical officials can be as practical and moderate as other branches of the Service, and would enormously facilitate the progress of such sanitary reform as is practicable under the peculiar conditions of the country and its people.

BODIES IN THE SPUTUM AND FÆCES RESEMBLING THE EGGS OF PARASITES.

Dr. William Hartigan forwarded for inspection peculiar bodies coughed up by a patient in the presence of a medical man practising in the north of Ireland. Of the bodies in question, some to the naked eye resembled ova, and were fairly uniform in size; some resembled freshwater cyclops in their outline and appearance; the remainder, seemingly, consisted of fragments of the above. The bodies in question were submitted for examination to Dr. C. W. Daniels, the Superintendent, and to Dr. C. M. Wenyon, Protozoologist at the London School of Tropical Medicine. The bodies in question were found to be merely mucous casts, modelled, no doubt, in the smaller bronchi of the lung.

This observation is interesting in itself, and in view also of the note by A. Chauffard, in the *Presse Medicale* of January 10th, 1906, referring to the eggs of parasites simulated by pollen in fæcal matter. The ovoid bodies described by Chauffard appeared to be ova, but as they did not resemble the ova of any known parasite they were submitted to a searching investigation, when they were determined to be grains of pollen from a coniferous plant.

J. C.

A Simple Guide to the Preservation of Health in South Africa. By H. Strachan, C.M.G., M.R.C.S., L.R.C.P., P.M.O. Lagos, West Africa. Second Edition.

This is a short pamphlet of no more than seven pages, published locally, it is presumed for gratuitous distribution; but it would be difficult to find elsewhere so much sound advice compressed into so small a space. Though written primarily for the assistance of Europeans residing in West Africa, it is almost needless to say that nine-tenths of its *dicta* are equally applicable to India and other tropical lands.

Though no more than a page and a half is devoted to precautions against malaria, it is astonishing how much has been included in the space; and we are glad to see that Dr. Strachan strongly recommends the adoption of mosquito-proof rooms. He admits that the guaze screens obstruct to some extent the free circulation of air which is so essential to comfort; but points out that "the extra safety to health is worth the extra inconvenience caused by a slightly increased degree of heat." There is, however, no reason why houses should not be so built as to be as comfortable as it is possible to be in such a climate in spite of their being made mosquito-proof.

The remedy lies in increasing the size of the windows and other openings so guarded.

West African houses are, however, usually extremely badly planned in this and almost every other respect of fitness for the climate they have to withstand; but, doubtless, in West Africa, as elsewhere, sanitarians such as Dr. Strachan have little or no opportunity of criticising the plans drawn up by the engineering authorities, and so have to make the best of the latter's bad jobs, after they have become accomplished and costly facts. Provided a room be designed with large openings coming down nearly to the floor, and that the house be so planned that a thorough current of air is possible, there is no reason why breeze enough to blow the papers off the tables should not find entry through wire gauze. We are glad to see, too, that Dr. Strachan recommends the *periodical* and not the *chronic* use of quinine as a prophylactic against malaria, in the form of a full dose (10 grs. quin. sulph., or 6 grs. of hydrochlorate) on two consecutive days weekly. There can be no doubt that the chronic quinine taking, which is so often recommended and practised in West Africa, has a most harmful effect on the nervous system, and indirectly on the general powers of resistence to truly climatic influences; and

that in view of the life-history of the parasite it is quite needless to dose one's self more frequently than is recommended by Dr. Strachan

Much of the pamphlet is naturally taken up with the management of tanks. Foreign as it may be to the popular idea of West Africa as a pathless swamp, the actual facts of the case are that the rainfall is by no means excessive for an equatorial climate, and that some of the most obtrusive discomforts of the country are the outcome of its liability to prolonged periods of drought. The surface wells are bad, and in the absence of regular waterworks, rain-water tanks with all their admitted liability to pollution are the sole available supply.

In some years the practically rainless period may extend to four or five months, even at Lagos, and to much more than this at Accra, so that the sort of stuff that is left at the bottom of the tanks at the end of such a period may be easily imagined, especially before their management was taken in hand by thoughtful sanitary experts of the type of the author of the pamphlet. While, however, the climate is to be considered as a somewhat dry rather than a wet one when compared with the majority of countries in the same latitude, its annual rainfall of 73 inches scarcely qualifies it to pose as a Sahara, and makes it certain that there must be plenty of good water to be got by paying for it. The solution of the difficulty lies with the financial authorities, as the engineers have no doubt excellent plans ready for adoption if only sufficient money be forthcoming. Let us hope that these monetary difficulties will soon be surmounted; for a good and ample water supply is everywhere the first essential of sanitation, and the possibilities of "the Coast" in the matter of health can never be fully realised until Dr. Strachan is able to even further abbreviate his pamphlet, by cutting out his excellent hints as to the management of rain-water tanks, on account of the latter having been replaced by regular water supplies in all centres of population.

THE CULICID FAUNA OF THE ADEN HINTERLAND.

By Lieutenant W. S. Patton, I.M.S.

(*Reprint from the "Journ. Bombay Nat. Hist. Soc.," November, 1905, p. 623.*)

This paper is a valuable contribution to our knowledge of what may be termed the Medical Zoology of a portion of Southern Asia, that up to now has been almost unexplored from this point of view.

Hitherto the whole of Arabia has been a *terra incognita*, and, with small reservations, the same remark applies to Somaliland and the shores of the Persian Gulf.

We must confess, however, that we should not have expected to find the Culicid fauna consisting so largely of new species.

Of the five *Anophilina* described, all are claimed as new, while one of the seven species of Culicines has also not been hitherto described.

The region is, however, a desert one, where the area of distribution of species would naturally tend to be circumscribed, and into which opportunities for the importation of the forms of neighbouring countries must be rare.

The descriptions are full and for the most part excellent, and the figures, though very rough, intelligible. The important detail of the banding of the legs is not, however, described in sufficient detail.

We are not quite clear whether the author adopts the classification of James and Liston, or that of Mr. Theobald, as some of the species have the latter's genera inserted in brackets after "Anopheles," while others have not.

One of the new species, "*Anopheles* (*Myzomyia*) *Jehafi*," is described as having the thorax "covered with brown-curved scales." Now it is a characteristic of Theobald's genus *Myzomyia*, that the thorax, except occasionally on the fore-edge of the mesonotum, should be devoid of true scales, as the chitinous appendages of this region are hair-like, and for practical purposes may be regarded as hairs. The term "curved scale" has a special signification in Mr. Theobald's system of classification, and if it can be correctly applied to those covering the thorax of this species, the genus has been wrongly assigned. The description, in fact, throws it into *Pyretophorus*, where I see the author notes it was placed by Mr. Theobald, who "suggested it might possibly be *A. cinereus*, Theobald." Judging from the plate of the wing I should say it was referable to that species.

It is similarly noted that Mr. Theobald identifies this author's *Anopheles Arabiensis* as his *A. Welcomei* from the Soudan. Now Mr. Theobald is none too loth to make new genera and species, and on such a point as the identification of one of his own species most would prefer to take his *dictum* to that of any other authority, and any attempt to unnecessarily lengthen the already bewildering list of species is much to be deprecated.

Lieutenant Patton did not come across Theobald's *Cellia Pharœnsis* during his researches, though the latter notes that it had been sent him from the Aden hinterland.

There is nothing surprising in this, but, curiously enough, the author evidently considers that Theobald must be referring to some of the specimens sent to the latter by himself, and does not seem to see that they must have been contributed by some other collector.

These, however, are details which need not diminish our congratulations to the author on a good and painstaking piece of work. G. M. G.

Abstract.

TROPICAL AUSTRALIA—IS IT SUITABLE FOR A WORKING WHITE RACE?

By J. S. C. Elkington, M.D., D.P.H.

Tropical Australia comprises rather more than one-third of the entire Commonwealth territory. One-half of Queensland, 523,620 square miles of the Northern Territory, and the north-western divisions of Western Australia, are included, totalling in all some 1,145,000 square miles. The country ranges from the Pacific to the Indian Ocean, includes practically

all ordinary varieties of tropical climate, and is dominated by the monsoonal winds. The greater part of it lies between 600 and 1,500 feet above sea-level, but extensive plateaux exist, covering many hundreds of square miles, at an elevation of over 1,500 feet, and ranging in Arnheim Land to 3,000 feet and over. Sufficient reliable physical cartography has been carried out in Northern Australia to effectively dispose of the old idea that the Northern Territory is a vast mangrove flat, and the remainder an arid waste of sand at or near sea-level. Elevation materially modifies climate, and the breezy tablelands of eastern North Queensland at least afford for many months of the year as "bracing" an atmosphere as can be found anywhere in the world.

Drought is a rare phenomenon in the monsoonal area, and the great northern rivers testify to the abundance and regularity of the annual revivification from this cause. These also afford waterways for considerable distances into the interior, and drain extensive areas of good pastoral country.

After discussing what are the objections to the settlement of a white race in tropical Australia and the problems to be faced, Dr. Elkington concludes as follows:—

"The future of tropical Australia appears to lie in the common-sense of the people, and of their representatives in the Legislature. In its present condition it must continue to form a monument to the lack of enterprise displayed by Australians, and a perpetual temptation to other races and people more appreciative of its varied endowments, and gifted with greater resolution and insight than we appear at present to possess. It is no question to be solved rule-of-thumb fashion by a mere trust in Providence. Tropical Australia should be a prize for the fittest, and if success is desired, every reasonable precaution will require to be taken to insure and maintain that fitness. As one possessing some knowledge of the cost and application of systems of sanitary administration, I am of opinion that this portion, at least, of the necessary administrative organisation will not prove costly, if gradually and sagaciously installed. Concerning its economic value, the facts detailed above will have afforded sufficient indication.

"Before any definite move can be made more will require to be accurately known concerning the topographical and other conditions of the country. From what can be gathered, however, the institution of an enquiry should be amply justified. In this age of land-hunger Australia cannot continue to act as the dog in the manger. Given sufficient industrial attraction, population will soon be forthcoming, and there appears to be no good reason why that population should not be a white one. Should the initial difficulties appear too great, the alternative of a coloured population is always feasible; but I, for one, would regret to think that the national pluck and enterprise upon which we Australians are rather apt to pride ourselves is insufficient to enable difficulties to be faced which have been met and overcome elsewhere under less favourable conditions."

INDIAN GOVERNMENT MANIFESTO ON PLAGUE PREVENTION.

THE following has been issued by the Home Department:

Calcutta, January 18.

"More than five years have now passed since the Governor-General in Council, when reviewing the report of the Indian Plague Commission, examined, in the light of the knowledge then available, various measures which had been proposed or adopted with the object of checking diffusion of the disease, and indicated the considerations of policy which must govern their introduction in India during this period. While the efforts of Government officers have in no way relaxed, and the people themselves have in many places shown a disposition to acquiesce and even co-operate in preventive measures which do not conflict with their social and religious usages, plague has gradually spread to almost every part of India, and subject to certain seasonal fluctuations, tends to recur year after year with undiminished virulence. About a year ago, the Government of India, acting in concert with the Royal Society and Lister Institute, made arrangements for the appointment of a scientific Commission, which is now investigating the causation of plague in Bombay and the Punjab. Pending the completion of these researches, which may extend over a long time, and will in any case be directed mainly to the scientific aspects of the problem, the Governor-General considered it desirable to place on record, in a concise form, the results of practical experience which have been acquired in the last five years of actual plague administration. The Local Governments were accordingly asked for reports based, as far as possible, on the personal experience of their officers, on the conditions affecting the origin and spread of plague, the character of the measures to be adopted against it, the degree of success attained, and the causes upon which success or failure depend. The ample materials thus collected place the Governor-General in a position to indicate those preventive measures which appear, under present conditions, most likely to be successful in the future.

"The most conspicuous change in the opinion of experts in India regarding plague since the issue of the Resolution of July 16th, 1900, is the greatly increased importance now ascribed to the part played by rats in spreading and keeping alive the disease. Rats are exceedingly susceptible to plague, and when once they are infected they usually communicate infection not only to man but also to houses which have undergone a thorough disinfection. It is therefore as essential to the safety of the community to destroy infected rats as to segregate plague-stricken people; in fact, almost all the evidence regarding the causation of plague may be regarded as pointing to the rat as the chief agent in its diffusion. For this reason the importance of destroying rats has been insisted on by the framers of the Paris Convention of 1903, and although European opinion is not unanimous on the point, the Governor-General considers that experience recently acquired in India warrants the belief that the systematic destruction of these animals promises to be one of the most effective measures that can be adopted for preventing the spread of plague.

"Observation has also shown that plague is most severe where the houses of people are crowded together, badly built and imperfectly ventilated, while it usually spares those areas in towns where the streets are wide, houses well built, the alleys and side walks paved, and the drains properly constructed. It follows that municipalities and local bodies should be encouraged and assisted to demolish insanitary quarters, to improve the paving of alleys and sidewalks, to neglect no opportunities of widening the narrow streets, to enforce simple building rules, and perfect their systems of drainage and conservancy. All go-downs where grain is stored should be rendered rat-proof, and should be liable to periodical inspection. In theory the disinfection of both houses and clothing takes a high place among preventive measures, and in cases of pneumonic plague it must be

regarded as imperative; but the great difficulty of carrying out the process thoroughly in a house casts some doubt upon its practical utility, and the Government of India leave it to local authorities to determine the extent to which it should be enforced with reference to prevalent structural conditions. In any case, the efficacy of house disinfection depends entirely upon the methods employed. The fluids used must be really germicidal, such as solutions of corrosive sublimate, cyllin, or izal. They must be intelligently applied under proper supervision, and care must be taken to prevent reinfection of the building by rats. These observations apply in their full force only to towns where the disease has not fully established itself. In villages the disinfection of houses is seldom of much use, while in towns, where plague has become indigenous, the difficulty of completely excluding rats leads to constant reinfection. Of the various measures hitherto adopted with the object of arresting an outbreak of plague none has proved so efficacious as the prompt abandonment of an infected locality for a period that varies with local conditions. In the case of villages, indeed, the evacuation of all houses, accompanied by the systematic destruction of rats, is probably the only means of effectually combating the disease. It is, however, essential that evacuation should be carried out thoroughly. If a portion of the inhabitants remains behind, the disease will continue to spread. In all cases where evacuation is feasible, the people should be encouraged to resort to it, assisted by the grant of blankets and warm clothing, where necessary, and by the provision of huts or materials for building them.

"The evidence which has been collected shows that the inspection of travellers by railway, road and steamship is often successful in averting or delaying the spread of plague, but that the efficacy of this measure depends on the circumstances in which it is applied. It is of most value in protecting limited areas such as hill stations and places so situated that inspection posts command all routes of access. The mere inspection of persons arriving by steamer is, however, of little use unless the rats on board the vessel are destroyed or are prevented from reaching the shore. A segregation camp for the detention of sick is a necessary adjunct to every inspection station, but no one need be detained who is not actually suffering from plague. In all other cases it is sufficient to record travellers' names and addresses and to arrange for their being under surveillance for five days. Experience has shown that mere contact with a case of bubonic plague in a railway carriage involves little danger of infection. The example of prisons proves that quarantine may be relied upon to prevent the spread of plague by human beings, but it can seldom be applied effectually, except by the people themselves, who have sometimes combined to prevent persons from infected places from entering their villages, and have provided accommodation for them outside the inhabited site. In rural areas the adoption of these measures may properly be encouraged, but they do not admit of application to towns. The removal of the sick to hospital, while it is eminently desirable in their own interests, has always been unpopular, and in cases of bubonic plague the necessity for it may be avoided, provided that the surroundings of the patient can be kept clean and free from rats. That the measure is instrumental, however, in delaying the spread of the disease is undeniable, and even though segregation may be relaxed when indigenous cases become widespread, the first few cases imported into a plague-free town should, whenever possible, be segregated without delay. Cases of pneumonic plague, which is directly infectious from man to man, ought always to be segregated. The segregation of persons who have been in contact with a patient suffering from bubonic plague is often impossible in practice. When it can be carried out with the good-will of the people the measure is no doubt useful, but where coercion has to be employed more harm than good is likely to result. In cases of pneumonic plague, however, the segregation of contacts is necessary, as the risk of infection is extreme.

"Inoculation with the prophylactic fluid now manufactured at the Parel Laboratory is of value, not merely for the protection which it affords against plague, but also by reason of its effect in mitigating the violence of an attack. The extent to which it may be adopted depends upon the strength of popular sentiment in its favour or against it, and the Government hope that the people may be encouraged to have recourse to it.

"While the experience of the last five years establishes the utility of the measures enumerated above, it equally teaches that their application must depend upon the circumstances of locality, the character of the people, the stage which the disease has reached, and the agency available for dealing with it. What is necessary in a district free from plague may be useless or vexatious where plague has become indigenous. What is effectual in one part of the country may be inoperative in another. A degree of control which is acceptable to a particular community may be strongly resented by the people who observe a different code of social usage, and in a province with a well-developed system of village officials more can be attempted than in a province where no such organisation exists. Where conditions vary so widely from province to province, as is the case in India, it is manifestly impossible for the Governor-General to lay down a uniform scheme of plague administration. The Local Governments alone are competent to determine what measures are practicable or expedient at particular times and places, and it is upon them that the Government of India rely to make the best use of the opportunities which present themselves for checking the spread of the disease. Finally, the Governor-General would observe that in the last resort all preventive measures depend for their success upon the hearty co-operation of the people themselves, and that every effort should be made to enlist their sympathies and to bring home to them, through their natural leaders and in any other way that may be practicable, that it rests mainly with them to bring about by their own action the cessation of plague in India, as it has long ago disappeared from Europe. When this conviction has been firmly established in the minds of the people, the task of district officers throughout India will be materially lightened, but that can only be obtained by carrying out thoroughly whatever measures it may be decided to introduce, and by impressing upon all officers concerned in plague administration that when a decision has been arrived at there must be no hesitation in giving effect to a policy approved by the Local Government."

Translation.

PRELIMINARY STATEMENT ON THE RESULTS OF A VOYAGE OF INVESTIGATION TO EAST AFRICA.

By R. Koch.

(*Translated from the German by P. Falcke.*)

(*Continued from page* 45.)

(2) Development of Protoplasma[1] (*sic*) Bigeminum.

The *Piroplasma bigeminum*, the active agent of Texas fever, is capable of undergoing a peculiar cycle of development in certain species of tick under particular climatic conditions.

In order to follow this development one should examine the contents of the stomachs of ticks removed from an infected beast which have gorged themselves with blood on several successive days.

The pear-shaped parasite, the chromatin of which has usually already divided into two distinct masses

[1] *Sic* in original. Obviously a misprint in the German article for *Piroplasma bigeminum*. (Smith and Kilborne.)

(fig. 3), leaves the red blood corpuscle and becomes elongated, one of the two chromatin bodies passing to the anterior extremity of the parasite and forming a sharp dark point. The other mass of chromatin remains in about the centre of the parasite, and has a less compact appearance (fig. 4). Ray-like processes appear on it near the point; at first two or three, later on more. At the inferior extremity of the parasite several rays or processes also often develop. The parasite has always an angular, radiating look (figs. 5 and 6). Often it resembles a mace pointed at one end, and exhibiting a granule of chromatin surrounded by stellate rays at the other extremity (figs. 7 and 8).

From the second day there are often found, in addition to the above described forms, others in which two specimens are connected by their posterior extremities, looking like one body with a central piece, and its two extremities furnished with star-like chromatin granules (fig. 9). I consider this form to be referable to some form of copulation. Besides these, globular formations appear, the interior wall of which is strewn at intervals with chromatin, and which in addition have a point of chromatin at the periphery (fig. 10). They convey the impression of having originated from copulating parasites which have cast off the ray-like processes.

The parasites provided with rays have a great tendency to unite into groups of from three to ten or more specimens, amongst which copulating couples may often be found. Moreover, one occasionally comes across longish, oval or pear-shaped bodies, which, when the plasma is stained blue, exhibit a moderately large nucleus of chromatin of granular consistency (fig. 11). These forms appear to me to be a transition to the comparatively large forms, which are likewise pear-shaped, and which I have frequently encountered in the ova of infected ticks (figs. 12 and 13). They are three or four times the size of the piroplasma in the blood of oxen, and it may therefore be assumed that other transition forms must exist. These should be sought for in young ticks. They may, perhaps, be found in the embryos, or immediately after the young are hatched, as it is known that the young tick is capable of conveying infection.

Hitherto I have not succeeded in discovering this transition form.

I was able to demonstrate the conditions of development of *Piroplasma bigeminum* in *Rhipicephalus Australis*, *R. Evertsi*, and in *Hyalomma Ægyptium*, but only in fully developed and gorged ticks and their ova. I never found them in the larvæ, nymphæ or ungorged adult specimens, though I frequently examined them.

(3) The Coast Fever of Oxen.

The parasites of Coast fever differ in so many essentials from the well-known piroplasma of the ox, dog, and horse that they are probably not specifically identical.

They do not exhibit the regular division into two, so characteristic of piroplasma. On the contrary, in Coast fever the parasites are always found to regularly divide into four, arranged in the form of a cross (⁘). This never occurs in the real piroplasma, but has been recorded in the disease discovered by Dschunkowski in Trans-Caucasian Russia, and which he has called tropical piroplasmosis.[1] In horses also there is a disease with parasites in the form of a cross[2] in addition to true piroplasmosis. It is therefore advisable to class those diseases in which cruciform parasites occur in one group.

Another peculiarity of Coast fever is that globular bodies in large numbers are found in the spleen and lymphatic glands; they consist of protoplasm staining blue, and contain a number of chromatin bodies. (The meaning of these forms is not sufficiently clear, and I defer their description till the appearance of my complete work.) Even before the parasites have appeared in the blood these forms are so regularly found in the spleen and glands that I was able advantageously to diagnose the disease in slaughtered animals by their presence.

I also succeeded in discovering the first stages of development of the parasite of Coast fever which are undergone in the tick. In this they are analogous to the *Piroplasma bigeminum*, as they, too, assume angular forms provided with rays; only they are considerably smaller and have fewer corners and rays (fig. 14). It is thus proved that the parasites of Coast fever, notwithstanding the differences alluded to, correspond, as to their developmental history, with the closely related true piroplasma.

It must be mentioned, in addition, that the development of this parasite had hitherto only been observed in adult and engorged specimens of *R. Australis*. This would seem to point to the inference that in Coast fever the infection only takes place by means of the young ticks of this or other species, in which it may be hoped that the further development of the parasites may, ere long, be worked out.

(To be continued.)

Miscellaneous.

THE ESPERANTISTS AND THE *BRITISH MEDICAL JOURNAL*.

The *British Medical Journal* has embroiled itself with the Esperantists, who have taken deeply to heart the Editor's description of their philological plaything as a "pigeon jargon." No class of medical man has better reason for desiring a means of international communication than the student of tropical medicine; but he is as little likely to waste his time on an unscientific attempt to facilitate it as his stay-at-home colleagues, for the very good reasons pointed out by the *B.M.J.*, that languages are evolved and cannot be made.

What the Esperantists appear to overlook is that

[1] By the demonstration of this cross-form I was enabled to confirm the distribution of cattle disease, which is very similar to Coast fever in the countries on the Mediterranean, in East Africa, and New Guinea.

[2] Dr. Kudicke demonstrated the same parasites in the zebra.

there is no need whatever of trying to enhance the curse of Babel by inventing a new tongue, as the acquirement of 2,000 words of any language will enable one to understand and be understood for all ordinary purposes, and hence all that is required is for the nations to decide on the medium of inter-communication.

There is a good deal to be said for the Journal's recommendation of Latin, but this can hardly be carried out in England until we have improved our public schoolmasters and university dons off the face of creation; for their system of teaching Latin by commencing with verse, and ending with a vocabulary of the least useful words and idioms will never give a vernacular knowledge such as is required for the work-a-day purposes of conversation. Added to this, their pronounciation is so barbarous as to be absolutely unintelligible to any foreigner. It may be admitted, too, that the richness and flexibility of the language, and the fact that our terminology is mostly Latin, of a sort, makes its use as a scientific *Lingua Franca* quite practicable, but it is still probable that the Journal underrates the difficulty of adapting it to such purposes. Dead Latin, that is to say, the Latin of Cicero, was evolved to meet the necessities of 100 B.C., and had already been found quite unsuitable to the necessities of the fourth century, A.D., as evidenced by the moans of the "schoolmen" on what they are pleased to call the decadence of the tongue at that period. This, however, is an unscientific view of the case, for the language had not decayed, but evolved; and it is doubtful if any stage of a language that is not in the use of a civilised populace of the present day is really suitable to our needs.

Nothing but international jealousies prevent the most desirable consummation of some one modern language being chosen for the purpose; and however pitiable the reason may be, English, French and German are at once out of court for the very reason that they are the tongues of "great powers." Why, then, should not modern Latin, or, in other words Italian, be chosen?

Ninety-nine per cent. of classical scholars of all nations would acquire a sufficient knowledge of this easy and beautiful language in a tithe of the time that would be required to enable him to adapt his knowledge of dead Latin to colloquial purposes.

So much of the best that has been contributed to tropical medicine has been written in Italian, that a working knowledge of that language is indispensible to all who desire to follow the literature of the subject; but there is no branch of science in which it is not rich, and it is needless to say that its non-scientific literature is second to that of no other nation. Latin is neither dead nor sleeping, but a living reality in its modern form, and in this way what we have learned of it would become of real use to us. Let us hope the question will be considered soon, as Italy is so rapidly advancing to the rank of a great power, that before long the claims its language to serve as an international tongue will have to be ruled "out of the running," and this would be unfortunate for all who have been at the pains to acquire a smattering of what should preferably be spoken of not as dead Latin but as Ancient Italian.

Personal Notes.

Indian Medical Service.

Captains to be Majors.—Cecil Robert Stevens, M.D., F.R.C.S., Leonard Rogers, M.D., F.R.C.S., Gordon Travers Birdwood, M.D., Cecil Charles Stewart Barry, Ernest Alan Robert Newman, M.D., Jay Gould, M.B., Reginald George Turner, James Davidson, M.D., and John Mulvany.

Lieutenant-Colonel W. A. Manson, I.M.S. is confirmed in medical charge of the 11th Lancers.

The services of Captains Hutchinson, Lindesay and Saigol, I.M.S., are placed at the disposal of the Bombay, Bengal, and Burma Governments respectively, the last named for plague duty.

Lieutenant-Colonel W. G. H. Henderson, I.M.S., reverts to military employ.

Captains W. A. Justice and W. Illius, I.M.S., are posted to Madras.

Major C. H. L. Meyer, I.M.S., on relief, to act as Professor of Medicine and Clinical Medicine and Therapeutics, Grant Medical College, *vice* Major L. F. Childe, M.B., I.M.S., proceeding on leave. Captain E. F. G. Tucker, I.M.S., on relief, to act as Professor of Pathology and Morbid Anatomy, and Curator of the Pathological Museum, Grant Medical College. Major C. H. L. Meyer, I.M.S., on relief, to act as First Physician, Jamshedji, Jijibhai Hospital, *vice* Major L. F. Childe, M.B., I.M.S., proceeding on leave. Captain H. Bennett, M.B., C.M., B.Sc., F.R.C.S., I.M.S., on relief, to act as Civil Surgeon, Surat. Captain F. H. G. Hutchinson, M.B., I.M.S., to be Resident Surgeon, St. George's Hospital, Bombay, *vice* Captain C. H. S. Lincoln, I.M.S., continuing to do duty as Deputy Sanitary Commissioner, Southern Registration District. Captain R. M. Carter, I.M.S., has been appointed to act as Civil Surgeon, Jacobabad, from November 1st, in addition to his own duties.

Lieutenant A. F. Hayden, M.B., B.S.Lond., L.R.C.P., M.R.C.S., has taken the Montefiore Bronze Medal and Prize in Military Surgery, and also the Martin Gold Medal in Military Medicine.

Military Assistant Surgeon N. S. Harvey, whose services have been placed at the disposal of this Government, to be Assistant to the Civil Surgeon, Naini Tal, with effect from December 8th, 1905, *vice* Military Assistant Surgeon C. G. Thompson, appointed Civil Surgeon, Garhwal.

India Office: Arrivals Reported in London.—Major J. S. Lumsden, I.M.S. Lieutenant R. F. Steel, I.M.S. Nursing Sister Miss W. M. Aldridge, C.A.M.N.S.I. Lieutenant-Colonel J. Brochi Mills, I.C.V.D. Lieutenant-Colonel J. W. Rodgers, I.M.S. Captain J. W. F. Rait, I.M.S.

Extensions of Leave.—Captain L. Rundall, I.M.S., 6 m., Med. Cert. Lieutenant J. W. H. Babington, I.M.S., 3 m., Med. Cert. Major H. A. Smith, I.M.S., 6 m., Med. Cert. Lieutenant-Colonel L. A. Waddell, C.B., C.I.E., I.M.S., 6 m., Med. Cert. Major F. Raymond, I.C.V.D., 1 m., Furlough.

Permitted to Return to Duty.—Lieutenant-Colonel T. R. Mulroney, I.M.S. Captain R. Bryson, I.M.S. Captain V. St. S. Mores, I.M.S. Major F. Joslen, I.C.V.D.

Colonial Medical Service.

Bridger,—J. F. E. Bridger, M.B. Lond., L.R.C.P., M.R.C.S., D.P.H., Medical Officer of Health, Bridgetown, Barbados.

Clough.—Dr. J. A. Clough, Medical Officer, Lagos, takes over the duties of Resident Medical Officer of the Lagos Hospital.

Frenais.—Dr. A. C. L. La Frenais, L.R.C.P.Edin., has been appointed a Government Medical Officer of British Guiana.

Taylor.—W. I. Taylor, M.D., has left Lagos on leave.

Wise.—K. S. Wise, M.R.C.S., L.R.C.P., has proceeded to British Guiana in the capacity of Government Bacteriologist, a new appointment connected with the Public Hospital, Georgetown. Mr. Wise has resigned his appointment of Demonstrator at the London School of Tropical Medicine which he had held for several sessions.

Domestic.

Births.

Jenney.—At Quetta, on January 24th, 1906, the wife of Major Jenney, I.M.S., of a son.

Maddox.—At Ranchi, on January 24th, 1906, the wife of Major Ralph Henry Maddox, Indian Medical Service, of a daughter.

McKechine.—At Jullundur, on January 25th, 1906, the wife of Captain W. E. McKechine, I.M.S., of a daughter.

Marriages.

Maclagan—Marony.—At the Cathedral, Lahore, on January 27th, 1906, by the Rev. W. B. Handford, Edward Douglas Maclagan, I.C.S., to Edith Marony, niece of Colonel T. E. L. Bate, I.M.S.

Whelan—Longhurst.—At Peshawar, on January 23rd, 1906, by the Rev. J. A. Cunningham, Captain J. F. Whelan, Royal Army Medical Corps, to Geraldine Arden, eldest daughter of the Rev. W. H. R. Longhurst, Vicar of Queenhill, Upton-on-Severn, Worcestershire.

List of Indian Medical Officers on Furlough.

(Under Civil Rules.)

Showing the Name, Province, and Department, and the Period from which the Leave was granted.

Anderson, Captain S., I.M.S., B. Med., to September 25th, 1906.

Anderson, Lieutenant-Colonel A. V., I.M.S., Bo. Med., 20 m. 3 d., September 10th, 1904.

Bennett, Captain V. B., I.M.S., Bo. Med., to June 22nd, 1906.

Browne, Colonel S. H., I.M.S., M.B , C.I.E., B. Med., 7 m. 15 d., September 13th, 1905.

Calvert, Major J. T., I.M.S., B. Med., 21 m., June 6th, 1905.

Clarkson, Major F. C., I.M.S., B.Comm., 17 m., June 16th, 1905.

Close, Major J. K., I.S., U.P. Med., 10 m. 2 d., November 29th, 1905.

Delany, Capt. T. H., I.M.S., B. Med., 17 m. 9 d., April 9th, 1905.

Donovan, Major C., I.M.S., M. Med., 12 m., March 8th, 1906.

Drake-Brockman, Major H. E., I.M.S., B. Med., 12 m., May 5th, 1905.

Drury, Major F. J., I.M.S., B. Med., 9 m., July 4th, 1905.

Duer, Major C., I.M.S., B. Med., 18 m., May 12th, 1905.

Fayrer, Captain F. D. S., I.M.S., M. Medl., 15 m., March 3rd, 1906.

Fullerton, Major T. W. A., I.M.S., U. P. Med., 12 m., February 18th, 1906.

Haffkine, W. M., C.I.E., Bo. Misc., 21 m., July 30th, 1904.

Henderson, Major S. H., I.M.S., U. P. Gaols, 9 m. 14 d., January 18th, 1906.

Hugo, Captain H., I.M.S., D.S.O., B. Med., 9 m., March 6th, 1906.

Irvine, Major T. W., I.M.S., 13½ m., September 29th, 1905.

Kemp, Captain D. C., I.M.S., M. Med., 4 m. 7 d., September 20th, 1905.

Lumsden, Major J. S. S., M.B., F.R.C.S., I.M.S., U.P. Med.

Lumsden, Major P. J., I.M.S., B. Med., 14 m. 13 d., September 10th, 1905.

Maitland, Lieutenant-Colonel I., I.M.S., M. Med., 12 m. March 30th, 1905.

Melville, Major H. B., U.P. Med., 20 m., March 1st, 1906.

Miller, Captain A., I.M.S., M. Med., 15 m., September 11th, 1905.

Morwood, Major J., I.M.S., U.P. Med., 20 m. 7 d., April 7th, 1905.

Mulroney, Lieutenant-Colonel T. R., P. Med., 23 m. 10 d., April 5th, 1904.

Niblock, Captain W. J., I.M.S., M. Med., 12 m., March 1st, 1906.

Orr, Major W. H., I.M.S., U.P. Med., 15 m. 4 d., December 3rd, 1905.

Perry, Captain E. L., I.M.S., P. Med, 9 m., August 15th, 1905.

Prain, Lieutenant-Colonel D., I.M.S., Botanical Department, 19 m., February 1st, 1905.

Rainier, Captain N. R. J., I.M.S., C.P. Med., 7 m. 23 d., November 19th, 1905.

Rait, Captain T. W. F., I.M.S., B. Medl., 19 m., March 21st, 1906.

Rogers., Major F. A., I.M.S., B. Med., 23 m. 2 d., January 14th, 1904.

Rundle, Lieutenant-Colonel C. S., I.M.S., Burma Med., 21 m. 7 d., July 28th, 1905.

Scotland, Major D. W., I.M.S., U.P. Med., 21 m., June 26th, 1905.

Shore, Lieutenant-Colonel R., M.D., I.M.S., B. Med., 15 m., February 1st, 1906.

Smith, Captain F. A., I.M.S., B. Med., 15 m., February 15th, 1906.

Smith, Major H. A., I.M.S., U.P. Med., 15 m. 4 d., July 23rd, 1905.

Stephenson, Captain J., I.M.S., P. Med., 13 m. 26 d., February 4th, 1905.

Stodart, Major J., I.M.S., Burma Med., 4 m., January 4th, 1906.

Street, Major A., I.M.S., Bo. Med., 9 m., January 15th, 1906.

Symons, Captain T. H., I.M.S., M. Med., 14 m. 22 d., August 21st, 1905.

Thomson, Lieut.-Colonel S. I., C.I.E., I.M.S., U.P. Comm., 11 m., May 1st, 1905.

Tucker, Captain W. H., I.M.S., M. Med., 10 m. 20 d., August 20th, 1905.

Vost, Major W., I.M.S., U.P. Med., 15 m., May 14th, 1905.

Wilkinson, Major E., I.M.S., P. Comm., 21 m., July 5th, 1905.

Wood, Major H. S., I.M.S., B. Med., 21 m., March 20th, 1905.

Young, Major W., I.M.S., U.P. Med., 21 m. 21 d., January 19th, 1906.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Bulletin de l'Institute Pasteur," T. iv.

BACILLARY DYSENTERY.

Médecin Major Ch. Dopter points out that dysentery is a symptom of several distinct diseases. There is, for example, a dysentery due to *spirilli*, another due to *Balantidium coli*, and a third to bilharziosis. But the two commonest are the amœboid dysentery of hot countries and the bacillary dysentery, which is found alike in the hot and temperate parts of the world. Though repeatedly noted, it was not till 1898 that Shiga succeeded in distinguishing the bacillus from the *B. typhosus* and *B. coli*. He further demonstrated its specific character by showing that the serum of patients agglutinated its cultures. The bacilli are short, with rounded ends, scarcely motile, not staining by Gram's method, not liquifying gelatin. The colonies, at first punctiform, grow and assume a foliated appearance, with a dark centre and clear periphery. Two years after Kruse found the same organism in cases seen in Westphalia. Since then Shiga's observations have been confirmed by a large number of workers in all parts of the world, and he has clearly demonstrated the specificity of the organism by producing the disease in rabbits, dogs and pigs, and by comparing his cultures and their behaviour with strains obtained from Shiga, Kruse and others. In announcing their investigations, the authorities quoted soon came to the conclusion that, in spite of morphological and cultural resemblances, there are really not one, but several, dysenteric bacilli which differed mainly in their agglutinating power. It was further shown that they differed also in their fermentive properties, the Shiga-Kruse bacillus failing to ferment mannite and maltose, while the Flexner-Manille organism does so. Leutz, however, regards the latter as not pathogenic, but only an associated organism. Park, Collins and Goodwin distinguish three sets of organisms :—

(1) Shiga's bacillus. Does not form indol. Ferments neither mannite, maltose, or saccharose. Inoculated animals yield a serum powerfully agglutinative for this, but only slightly for the other classes.

(2) Bacilli which form indol, ferment the above sugars, and in which the serum of inoculated animals agglutinates cultivations of this type and also those of the third sort.

(3) The Flexner-Manille type, which forms indol, ferments the above sugars,and in which the serum of inoculated animals agglutinates cultivations of this and the second class, and also the *coli* bacilli. Some authors, however, make a more minute classification, but there appears to be a general tendency to regard the Shiga-Kruse bacillus as alone specific, and the Flexner as associated with them. The author then enumerates and describes in detail the organisms that have been described up to date, the general conclusion hitherto arrived at being that cases may be divided into two classes : First, true bacillary dysentery, caused by the Shiga bacillus ; and secondly, a variety of pseudo-dysenteria caused by a variety of pseudo-dysenteric bacilli. He then describes in detail his own observations on these organisms, and discusses the clinical and epidemiological evidence, and concludes that in spite of the arguments brought forward by his predecessors, there is no sufficient reason for subdividing bacillary dysentery.

He admits that in a general way dysenteric bacilli can be arranged in two groups, but it is inexact to assert that the Flexner bacillus can be further subdivided. He, however, regards all forms as really identical, and all equally specific, and on this account considers that such terms as "true dysentery," infantile dysentery, &c., should be abandoned in favour of the one term, bacillary dysentery.

"Journ. of Hyg.," T. jafic. 4, 1905.

SARCOSPORIDIAN FOUND IN THE MUSCLES OF A MONKEY.

Korte, W. E.—These organisms were found in a *Macucus rhesus*, and are the first ever found in any monkey. The parasites are sausage-shaped, surrounded by a capsule which shows a fine striation perpendicular to its surface and filled with spores.

"C. R. Soc. Biol.," T. lix., 1905.

INTESTINAL COCCIDIOSIS OF THE OX IN TUNIS.

Ducloux, E.—He describes a serious malady principally affecting young oxen, and often fatal, charactised by severe diarrhœa, at first liquid and then sero-sanquinolent. The lesions are found in the abomasum and intestine. The epithelial cells of Leiberkühn's glands of the large intestine are found to contain coccidii, which are tetrasporocystic and digoic. Similar cases appear to have been recognised in France and Switzerland.

"Munch. Med. Woch.," T. lii.

PENETRATION OF THE SKIN BY LARVAL ANKYLOSTOMES.

Bruns, H., and Müller, W., obtained positive results in the case of ten dogs on which the larvæ were either placed on the skin or injected beneath it.

Their first two attempts to infect the human subject by placing the larvæ on the skin of the forearm failed, but two others, in which the skin was soaked in warm water for half an hour, succeeded. In the first case eosinophilosis appeared after three weeks and eggs in the stools on the 53rd day; in the second case after 20 and 46 days respectively. The authors consider, however, that infection by the mouth is the commoner and more certain method.

"Lancet," February 17, 1906.

MALTA FEVER IN INDIA.

Captain W. H. C. Forster, who is Deputy Sanitary Commissioner in the Punjab, recalls the fact that Wright, at Netley, demonstrated the specific reaction of Malta fever in patients invalided from India, and these observations were confirmed by Lamb and Birt in India. Doubts were, however, thrown on the accuracy of these observations, and "at the beginning of the present year it was officially held that Malta fever had not been proved to exist as an endemic disease in India." Lamb and Pais have, however, recently removed all doubt on the subject by isolating the *Micrococcus melitensis* from the spleens of Indian cases. These writers *inter alia* described cases occurring among the 14th Sikhs at Ferozapur, and in view of the work of Dr. Zammit and Major W. Horrocks on goats in Malta, Captain Forster decided to repeat their observations on the goats supplying milk to the 14th Sikhs. The result was that 4 out of 38 goats examined gave a positive reaction, and that two of these, which were taken for further observation to the Pasteur Institute, Kasauli, were found to yield milk infected with the specific organism of Malta fever. Any doubts as to the occurrence of the disease in India may therefore be considered to be set at rest.

Notes and News.

PROFESSOR KOCH starts for East Africa early in April.

The chlorine-free culture medium for the *Bacillus lepræ*, by the use of which Captain Rost, I.M.S., in Rangoon, claimed to have succeeded in cultivating the pathogenic organism of leprosy, has been tested by Dr. Frank Tidswell in the laboratory of the Leper Asylum of the Government of New South Wales, but

without success. The stringy, heavy deposits, described by Rost did not appear, and though there were a few of what appeared to be leprosy bacilli in the first culture, none appeared in the second.

It will be noted that this confirms the negative results obtained in a test last year, instituted at the Pasteur Institute, Kasauli. We hope, however, that Captain Rost will not be discouraged from continuing his experiments, which were conducted in a truly scientific spirit, as the practical therapeutic results of the treatment he based on them were, according to independent medical testimony, undoubtedly remarkable, whatever may have been the merits of the theory on which they were based.

Enteric in India.

The (Indian) *Pioneer* devotes a leading article to the the closing of the controversy between Sir Thomas Gallway, P.M.O., in India, and Dr. Leigh Canney, in the columns of the *Times*, as to the etiology of typhoid fever. Dr. Canney advocates the theory that water carriage is practically the only vehicle of infection that need be taken into practical consideration; while Sir Thomas represents what is undoubtedly the opinion of the vast majority of medical observers who have had to deal with typhoid in India and in many other tropical countries. No one, of course, denies the importance of drinking water as a potential vehicle, but it is an undoubted fact that though cantonment water supplies in India have now almost universally been raised above suspicion, their steady improvement has not been followed by any proportionate diminution in typhoid. Water is only one, in fact, of a number of possible vehicles, and in India flies and dust are probably more often implicated than drinking water, and it is in guarding against these sources of infection that further improvement may be looked for.

Plague and Small-pox in Rangoon.

During the last month there were 128 cases of plague, with 126 deaths.

The number of cases of plague for the year ending the 4th ult. in Rangoon, where the epidemic began on February 4th, 1905, is 2,969, with 2,672 deaths. There were in January 425 cases of small-pox in Rangoon, being the largest number yet known.

The Indian plague returns for the week ending January 27th show 3,747 deaths, compared with 4,240 in the week preceding. The principal figures are: United Provinces, 958; Bengal, 896; Bombay Presidency, 707; Punjab, 381; Central Provinces, 484; Burma, 136.

The immunity of Europeans continues to be one of the most noticeable features of the plague epidemic. Last year in the Bombay Presidency, where the disease carried off over a quarter of a million people, only nineteen Europeans in all were attacked, of whom ten died. In the previous year, in the same region, where 316,000 deaths took place, only eight were amongst Europeans.—*Pioneer Mail*, February 9th, 1906.

PURE WATER FOR TRAVELLERS.

In the Tropics and Sub-Tropics where water-borne diseases are so prevalent, and wherever water is suspected of being impure, any apparatus that really purifies water, rendering it sterile and yet leaving it pleasant to the palate and good for the health, must needs be of the highest value and importance. Even the best of filters have their limitations, the objections to them are well known. The "Gem" Pure Water Still, of which an illustration is given, removes all impurities—germs and mineral matter—by the effective process of distillation. The still is in three parts: In the lowest the water is boiled and vapourised, the vapour rises, and striking on the top part, which is filled with cold water, is condensed and trickles into the middle section, whence it is drawn off into a bottle. The still has been approved by high medical authority, and its value has been proved by travellers in Persia, Africa, China, and elsewhere. It is made entirely of metal, there is no rubber or mechanism to get out of order; it is simple, light, portable, effective, and in every way satisfactory. The "Gem" Supplies Co., Ltd., of 121, Newgate Street, London, will send particulars of the still to any of our readers who may enquire. Of course, this still is as useful to residents as to travellers. Indeed, a great many "Gem" stills are constantly in use even in Great Britain, in many parts of which the quality of the ordinary water leaves much to be desired.

PLAGUE.

Prevalence of the Disease.

	Cases.	Deaths.
India.—Week ended Jan. 6th ...	5,184	4,278
,, ,, 13th ...	5,029	4,240
,, ,, 20th ...	4,652	3,938
,, ,, 27th ...	4,478	3,747
,, Feb. 3rd ...	6,116	5,042
Hong Kong.—Week ended Feb. 3rd	2	2
,, ,, 10th	6	6
,, ,, 17th	5	4
,, ,, 24th	12	12
Mauritius.—Week ended Feb. 16th	1	1
,, ,, 23rd	0	0

South Africa.—No cases of plague.

Notices to Correspondents.

1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the Journal of Tropical Medicine should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communication.

A HÆMOGREGARINE OF MAMMALS AND SOME NOTES ON TRYPANOSOMIASIS IN THE ANGLO-EGYPTIAN SUDAN.

By Andrew Balfour, M.D., B.Sc., M.R.C.P.(Edin.), D.P.H.(Camb.).

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A Hæmogregarine of Mammals.

H. jaculi—H. balfouri (Laveran).

Being one of the Craggs Prize Essays recently awarded by the London School of Tropical Medicine.

[The first part of this paper was published in the Journal of August 15th, 1905.]

While carrying out work in connection with trypanosomiasis, I have had occasion to make numerous examinations of the blood of the jerboa, or desert rat (*Jaculus jaculus*, or *J. gordoni*, as I believe it has been renamed) (fig. 1).[1]

Fig. 1.

In the first blood examined I was surprised to see that a large proportion of the red blood corpuscles harboured an unpigmented and non-motile parasite. In the stained specimen it was at once apparent that we were dealing with some kind of trophozoite. Twenty-nine jerboas have up to the present been examined, and in all of them, with the exception of two very young animals, this parasite has been found. Specimens were sent to Professor Laveran, who at once declared the parasite to be a hæmogregarine, and has kindly informed me that the discovery is one of much interest. He has further urged me to publish some notes upon its life-history, although my observations are yet far from complete.

The Appearance of the Parasite.—The trophozoite in the fresh blood appears as a pale, hyaline, homogeneous body, slightly curved and with rounded ends (sausage-shaped), lying either apparently free or in the remains of a red blood corpuscle. The latter may be represented only by a bow uniting the two poles of the parasite, just as it is sometimes seen in the case of malarial crescents. The free forms, I believe, owe their condition to a total destruction or absorption of the substance of the erythrocytes which once contained them. As stated, the parasite is non-pigmented and non-motile, and I have found it to be rather resistant, remaining to all appearance unchanged in sterile citrated blood for a period of seventy-two hours, both when kept at room temperature (about 36° C.) and at 22° C. It is to be noted, however, that it altered somewhat in its staining reactions. As a rule, it measures from 5·6 to 7 μ in length, and from 1·4 to 2·8 μ in breadth. The number present has been found to vary considerably. There may be six or seven, or even more, present in each microscopic field (Leitz oc. 4, oil imm. $\frac{1}{12}$), or only a few may be found in the whole blood smear.

Staining the Parasite.—On staining by the Leishman-Romanowsky method, in exactly the same way as for malaria protozoa, the structure of the parasite becomes at once apparent, and the shape, as described above, well defined. A large oval nucleus, constituting, as a rule, about one-third of the organism, is seen to be present, situated generally in the centre of the parasite and stretching right across it, so that there is a deep blue-staining area (the nucleus) in the middle, and a faintly staining blue area with a rounded end on either side. Occasionally, but rarely, and then usually under special conditions, spherical chromatin dots may be found in one or other of these pale polar areas. In stained preparations it is common to find that no vestige of the red blood corpuscle which originally harboured the parasite remains (Plate I., *c*), but careful search will nearly always reveal one or two parasites with portions of the red-staining erythrocyte adhering to them. All that may be present is a thin, red, curved line stretching from pole to pole across the slight concavity of the parasite (Plate I., *a*). Sometimes, especially if the blood be citrated, the relation of the parasite to the blood cell which contains it is beautifully shown. A process of absorption of the cytoplasm of the red cell evidently goes on, and in a severe infection there must be a considerable destruction of erythrocytes. The animal host, however, does not seem to suffer in health. I have kept a jerboa with a considerable infection for three months in the laboratory, and it remained well and lively throughout the whole period. Two others died in captivity, exhibiting violent *ante-mortem* convulsions, and it is worth noting that these rodents do not stand handling well, and must not be supplied with water.

In the peripheral blood it is customary to find all the parasites at or about the same stage of development. True, they differ somewhat in aspect. Thus it is not uncommon to find the nucleus situated at one pole, so that half the parasite stains a deep blue and the other half a very faint blue. Again, one end of the parasite may be pointed, so that the body is club-shaped. This is probably due to alteration during the preparation of the blood smears. In the heart's blood of a jerboa which died naturally I found two distinct forms, a large swollen variety (11·2 μ by 4·2 μ), in which the greatest increase had taken place in the light-staining part of the protoplasm, and a form like those already described (Plate I., *d*). It was very noticeable that the nuclei of the former, often of a triangular shape, stained a deep Romanowsky purple, and frequently did not stretch wholly across the para-

[1] We are informed that *Jaculus Gordoni* has been distinguished from *J. jaculus* on account of differences of coloration, though it is quite possibly merely a local race of the latter.—*Ed. J. T. M.*

site, and in the large pale-staining area three or four spherical chromatin dots were often to be observed.

Professor Laveran has seen this preparation, and points out that such peculiarities in morphology frequently occur. He does not regard these as special sexual forms. At first I was inclined to consider the parasite as being allied to the halteridium of birds. I noted, however, that it was not pigmented, was not curved so much as the halteridium forms, and never exhibited the spore formation at either end as does *Halteridium danilewskyi*.

Endoglobular Hæmogregarine of this Class not Found Previously in the Red Corpuscles of Mammals.—As Professor Laveran kindly pointed out to me, and as, indeed, was soon apparent from a study of the literature, especially Professor Minchin's treatise on the sporozoa, this parasite of jerboa closely resembles the *Hæmogregarinidæ* of cold-blooded vertebrates. This fact is of extreme interest, as I am unaware of any endoglobular parasite of this class having been described in the blood of mammals. Bentley (1) has recently produced a paper on a leucocytozoon of the dog in Assam, but I understand there is some doubt as to his parasite, also described by James (2), which, moreover, affects the leucocytes. The classification of this order of parasites given by Professor Minchin is as follows :—

"Order *Hæmosporidia* (Danilewsky).

"Sub-order I. *Hæmosporea*.

"Genus i. *Lankesterella* (Labbé, 1899) for *Drepanidium* (Lankester). The hæmogregarine is not more than three-quarters the length of the blood corpuscle it inhabits.

"Genus ii. *Karyolysus* (Labbé, 1894). The hæmogregarine does not exceed the corpuscle in length.

"Genus iii. *Hæmogregarine* (Danilewsky, 1897), (syn. Danilewsky-Labbé, 1895).

"The body of the parasite when adult exceeds the corpuscle in length, and is bent on itself within it in a characteristic manner like the letter V."

Now the parasite of the jerboa in question does slightly exceed the corpuscle in length, but is only slightly curved. It looks as a rule as if it had outgrown its corpuscle, and sometimes the remains of what has evidently been a distended and distorted corpuscle can be seen lying around it. The large, swollen, and bloated forms are much larger than the corpuscles which originally contained them, and are found lying free. On several occasions, and especially in fresh preparations from the bone-marrow, I have noted forms slightly turned up at one end and looking like an incomplete letter V. I have not been able to demonstrate this appearance in stained specimens.

Laveran's classification, in which the genus *Hæmogregarine* is made to include *Drepanidium* and *Karyolysus*, is more simple, but whichever be adopted, it would seem that this parasite is undoubtedly a hæmogregarine, and I propose to give it the provisional name of *H. jaculi*,[1] though it is quite possible it may be found in other mammals. Indeed, I have recently discovered what seems to be the same parasite in the mononuclear leucocyte of the Norway rat (*Mus decumanus*) in Khartoum (Plate I., *f.*). It is probable that it exists as a leucocytozoon in the rodents, but further observations are required. I have once found free forms in smears from the splenic pulp of a Norway rat.

Reverting to the parasite of the jerboa, a study of its life-history has further indicated its relation to the *Hæmogregarinidæ*, for I have succeeded in finding two further stages, *i.e.* :—

(1) The free, motile vermicule form.

(2) The stage of schizonts in the form of cytocysts.

In one instance only have I found the free trophozoite. I discovered two such forms in the peripheral blood of a jerboa, which showed the endoglobular trophozoite in fair numbers and which had some injections of the serum of a water-buck in connection with the trypanosome work.

A Free Motile Form of the Parasite.—This free form is in length about three times the diameter of a red blood corpuscle, is pointed at both ends, and moves very slowly through the blood, progressing by a series of contractions of its cytoplasm, the so-called "euglenoid" movements. As a result constrictions appear in the body of the parasite, as many as three having been seen present at one time. These, so to speak, run along the body of the parasite, which thereafter assumes its usual cylindrical shape and glides steadily across the field, always proceeding in one direction and with the same end in front. It pauses for greater or longer periods, undergoing various alterations in shape.

If it encounters a clump of red blood corpuscles it disappears among them, producing only a slight agitation amongst the erythrocytes, which it pushes out of its way. Granules are visible in the posterior part of the body. No flagellum has been seen nor anything to suggest the extrusion of a gelatinous thread, as occurs in the case of some of the gregarines. I have been fortunate enough to secure a stained preparation of this free trophozoite, the appearance of which further demonstrates its resemblance to a hæmogregarine (Plate I., *b.*).

Anteriorly there is a somewhat sharp-pointed area staining a light blue and in which close to the nucleus a chromatin dot is visible. Following this clear area comes a very lengthy, oblong, deeply stained nucleus. At one point it showed a constriction similar, no doubt, to those seen in the fresh preparation. It had been killed, fixed, and stained in the act of progression.

Behind the nucleus is a lengthy, light-staining area, terminating in a pointed extremity. This area stains a light blue with the Leishman stain and exhibits a cluster of chromatin dots, arranged in a somewhat rosette form immediately behind the nucleus. I noted a single central dot with six others arranged in a circle around it. A few similar dots, irregularly arranged, are also visible close to the posterior extremity.

Measurements :—

Total length	15·5 μ
Length of the nucleus	7 μ
Length of anterior light area ...	2·8 μ
Length of posterior light area ...	5·7 μ
Greatest breadth	2·8 μ

The nucleus, it may be said, stretches completely across the body, entirely separating the anterior from the posterior moiety. The broadest part of the

[1] Professor Laveran has recently written me to say that he has given the name of *H. balfouri* to this parasite.

parasite is towards the posterior end of the nucleus. In most cases a third stage can be readily demonstrated. This is chiefly seen in the liver and kidney, organs where the circulation is slow, and will probably be found also in the bone-marrow and brain. Indeed, some smears of the bone-marrow have shown what were probably empty cytocysts. In thick smears from the liver and kidney well-defined cysts are found, the walls of which are apparently formed by the remains of cells of these organs which have been destroyed by the parasitic growth (Plate II.).

These cysts vary much in size. The largest I have noted occurred in a liver smear and measured 39·6 μ by 33·6 μ. A common dimension appears to be about 22·4 μ by 16·8 μ, but many smaller cysts occur.

It is usual to find some of these cytocysts empty, or at the most containing a little residue protoplasm, but a certain proportion are found to contain merozoites (Plate II.), readily recognisable by their shape and nuclei, and somewhat resembling the trophozoite stage in the blood. The nuclei, however, are comparatively small, and in many cases the merozoite appears to be longer and more pointed at the ends than the endoglobular trophozoite.

Schizont Forms.—Early schizont forms also occur, in which the protoplasm contained within the cyst wall has not been differentiated and stains more or less uniformly. Sometimes darker-staining portions indicate the future nuclei of the merozoites. When complete division has taken place some residual protoplasm remains behind, and the whole condition is very like that which has been described by Labbé (3) in the case of *Karyolysus lacertarum*. Sections of the liver stained by the Giemsa method show all stages of the schizonts. Mitosis of the nuclei and the formation of daughter nuclei are well seen.

Appearances are very like those presented during the schizogony of some of the Coccidia, notably *Adelea ovata* are exhibited, and the whole condition from the invasion of the liver cell to the bursting of the cyst and the freeing of its contents can be traced. The merozoites in a ripe cyst can be seen to be arranged side by side nearly all round the periphery of the central undifferentiated mass of protoplasm which remains as the residuum.

By what channel the hepatic cell is invaded has not as yet been determined, but it is probably through the capillaries.

The interesting appearances presented by these liver sections, which were kindly prepared for me by Mr. Richard Muir, of the Pathological Department, University of Edinburgh, and required detailed study, are further confirmation, if any were required, that this parasite of jerboas is a hæmogregrine.

Laveran (4) has pointed out that the schizont stage of these parasites in reptiles is passed in the liver, and Labbé has given much attention to this subject. I have not yet been able to decide whether dimorphism occurs, and if micro- and macro-merozoites can be distinguished, but it is probable that such will be found to be the case.

Before seeing the liver sections I was under the impression that the non-sexual cycle was as follows: The trophozoite is set free from the erythrocyte as the travelling vermicule, which eventually penetrates a cell of the liver or kidney, and gives rise to schizonts in the form of cytocysts. In these the merozoites are formed which, after certain changes, eventually escape into the blood stream, invade red blood corpuscles, and so restart the cycle of schizogony.

So far, however, one has not been able to see anything like the travelling vermicule in the liver sections. The form invading the hepatic cells looks like the trophozoite of the peripheral blood, or, at the most, one of the swollen forms already mentioned. Is it, then, possible that the travelling vermicule plays no part in this cycle? This is possibly so; or, again, as Labbé asserts, for Lankasterella and Karyolysus an isogamic conjugation may take place between two of these free forms, and it may be the zygote so formed which can be seen penetrating the liver cells. Many, however, disbelieve Labbé's conclusions, which have not been confirmed by the observations of Hintze (5) on Lankasterella, so possibly the free trophozoite directly invades the liver cell and becomes the schizont, while the free vermicule is intended to play a part in an extracorporeal sexual cycle. This leads us to consider the habits of the jerboa and the parasites which it harbours.

The rodent is a nocturnal animal, living in holes in the desert, remaining invisible throughout the day, but found hopping about in the evening and on moonlight nights. It exists far away from any water, which it does not seem to require, and its food probably consists of the minute seeds of the small plants which contrive to exist in sandy wastes. The animal is easily caught in traps baited with millet.

Both fleas and mites are found on the jerboa. The species of *Siphanoptera* present has not been determined, but I have dissected and examined the internal organs of engorged fleas taken from infected animals. My observations have been limited, but, so far, though I have found unaltered parasites in the blood from the stomach of a flea, nothing has been seen which suggests that a stage is passed in that insect. Further dissections are required. Some blood containing endoglobular trophozoites was placed in the acid citrate solution devised by Rogers (6) to stimulate the conditions present in an insect's stomach. Though kept in this medium for over forty-eight hours at room temperature, no change took place in the parasites, save that their cytoplasm became more granular.

I have not be able to examine the mites, which are extremely minute and not very often present. As the jerboa is nocturnal, I thought it well to chloroform one during the night, and at once examine its blood and organs. I failed to find the vermicule form or anything but the free and endoglobular trophozoites.

It should be said that to the naked eye there is no morbid appearance presented by any of the viscera. The spleen seems never to be enlarged, and, as far as can be told, the liver does not appear abnormal.

Further, it may be stated that numerous free forms (trophozoites or merozoites) are usually present in smears made from the liver, kidney and bone-marrow, and to a less extent in those from the spleen.

Professor Laveran writes me to say that he has now found the same parasite in jerboas from Tunis, so that no doubt much information will soon be forth-

coming regarding this interesting parasite of mammals. It will be of special interest to determine if it really exists as a leucocytozoon in *Mus decumanus*, or whether in the case cited the mononuclear leucocytes were merely taking on a phagocytic action, or whether the parasite found in the Norway rat is another distinct variety.

In concluding this paper, I would record my sincere thanks to Professor Laveran for his kind interest and advice; my indebtedness to Dr. Beam, chemist to the laboratories, for the photomicrographs; to Mr. Muir for the drawing of the vermicule; and to my laboratory assistant, Mr. Friedrichs, for his useful aid in the work.

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SOME NOTES ON TRYPANOSOMIASIS IN THE ANGLO-EGYPTIAN SUDAN.

In the *British Medical Journal* of November 26th, 1904, I published a preliminary note on the above subject. This article referred to the fact that I had found trypanosomes in the blood of a donkey from the Bahr-el-Ghazal, that Head (1) had discovered similar parasites in mules from the same region, and that in smears from the blood of Shilluk cattle which he had submitted to me for examination I had found these flagellates. Since that paper appeared a considerable amount of information has been obtained, and a good deal of research work has been carried out in the laboratories upon what is a very important subject in a country like the Sudan. The following are the chief points to which I wish to direct attention:—

(1) The prevalence and distribution of trypanosomiasis in the Sudan.

(2) The presence in cattle of a small trypanosome which Laveran has declared to be a new species, and which he has named *T. nanum*.

(3) The question as to whether equines, or at least mules, are liable to a double infection by two different species of trypanosomes, or are the hosts of a *T. dimorphum* resembling that which affects horses in Senegambia.

(4) The great frequency of hæmorrhagic ulcerative lesions of the stomach in trypanosomiasis and their significance, also the comparative frequency of intestinal ulceration.

(5) The occasional presence of spirilla in these gastric lesions, both in the blood clot adherent to the ulcers and in the ulcerated surfaces.

(6) The action of chrysoidin as a therapeutic agent in trypanosomiasis.

(7) The therapeutic action in trypanosomiasis of the blood serum of wild animals (big game), whose habitat is in trypanosome-infected areas, a line of research suggested by Dr. Sheffield Neave (*vide infra*).

(1) *As regards Prevalence and Distribution.*—There can be little doubt that in the Southern Sudan, that is to say, in the region south of the tenth parallel of latitude, trypanosomiasis exists to a very considerable extent. An illness known to be due to the bites of tsetse-flies, and affecting donkeys, horses, mules, and possibly camels, has been recognised in the Bahr-el-Ghazal province since that distant region was visited after the reconquering of the Sudan. Expeditions have experienced considerable losses in transport animals from this cause. Again, and more recently, sick and emaciated animals have been coming from the Upper Sobat district, and especially from the neighbourhood of Itang, a station on the Baro River, in Abyssinian territory.

Old records also speak of animals dying from fly-bite on the upper reaches of the Blue Nile, but accounts are so vague, both as regards the nature of the illness and that of the fly said to cause it, that no definite conclusion can be reached regarding the prevalence of trypanosomiasis in that region. No cases have been sent me from the Blue Nile provinces, and I have not received s amples of tsetse-flies from these parts, nor seen them between Roseires and Wad Medani, where the river is more or less bordered by bush and forest. In the Northern Sudan, the region of sandy wastes, as pointed out in the preliminary note, trypanosomiasis has not been found to exist; but no great number of examinations have been made, and investigations upon frogs, lizards, and a large number of birds have yet to be conducted. Dr. Sheffield Neave, Travelling Pathologist to the Laboratories, has been working down Nile from Gondokoro, and has found trypanosomes in at least three species of Nile fish, in a lizard, in kites, and in vultures. These finds in birds are especially interesting in the light of Novy's and M'Neal's recent researches. (2)

For the purpose of gathering information and material regarding the trypanosomiasis of Shilluk cattle, I accompanied Colonel Griffith, the Principal Veterinary Officer, to Taufikia, near the mouth of the Sobat River, and 522 miles south of Khartoum. The journey was undertaken in January, 1905, and at Melut, fifty miles north of Kodok (late Fashoda), a herd of Shilluk cattle was inspected. Three sick animals were picked out and examined. In the blood of one of these I found a trypanosome identical with the parasite found in Shilluk cattle at Khartoum which had come from the Kodok region.[1] Nothing was found in the blood of the other two animals, but it is probable they were suffering from the disease, as they presented the characteristic symptoms, *i.e.*, extreme anæmia of the mucous membranes, weakness, emaciation, and some running from the nose. At Melut we received vague information as to the presence of a fly-belt a considerable distance inland, and were told that the cattle became infected after the rainy season, *i.e.*, in August. On these cattle, as in those at Khartoum, large numbers of the tick called *Amblyomma variegatum* were found, as well as flies of the genus *Hippobosca*. It may be said at once that examination of these insects has always proved negative, but, as will be shown, the trypanosomes are never very numerous in the blood of cattle.

[1] The recent discovery of *G. morsitans* in Southern Kordofan probably explains the prevalence of tsetse diseases in this district.

A herd which had just been imported from the north showed no signs of disease.

At Kodok a small herd was seen, and one sick cow, which eight months previously had come from Melut, was examined. It was distinctly thin and anæmic, but no parasites were found in its blood.

At Taufikia six separate herds of cattle were inspected, the bloods of twelve sick beasts were examined, and trypanosomes were found in one animal only—a cow from Abyssinia—which had recently aborted and was in a dying condition.

This trypanosome proved to be *T. nanum*. Three sick mules, coming also from near Itang, were found to harbour trypanosomes. These were not the same species of parasite as those found in cattle, but appear to be identical with those discovered by Head in mules from the Bahr-el-Ghazal. A dog was inoculated from one of these mules and brought to Khartoum, where it developed trypanosomiasis. It was from this strain, carried on by successive passages through animals, that I have been able to study the parasites of the disease in mules. The cow from Melut was also brought to Khartoum, and will be again mentioned in due course. At Taufikia a monkey (*Cercopithecus sabaeus*), a bat, and a black and white crow were examined, with negative results.

Out of three sparrow-like birds examined, two showed halteridia in the blood.

It is difficult to base any conclusions on such limited observations. The trypanosomiasis of cattle is a chronic disease to all appearance, and it will be some time before its prevalence is correctly gauged. In equines the malady appears to be common in the Bahr-el-Ghazal, where *G. morsitans* is found, and probably exists to a considerable extent on the Upper Sobat. On the mules at Taufikia large numbers of a species of Stomoxys were found, biting fiercely, specially in the evenings. No opportunity of properly examining these flies was afforded. In one, which was dissected, no trypanosomes were found, but several hours had elapsed before its stomach contents were examined. One may here refer to human trypanosomiasis, which so far has not been encountered within the confines of the Sudan, though, as previously noticed, Dr. Neave (3) found Leishman-Donovan bodies in the spleen of a boy coming from Meshra, in the Bahr-el-Ghazal. At Taufikia I found that a Sudanese battalion was being recruited to some extent from Uganda, and discovered that twelve men had come from Kampala, close to Entebbe, a centre of the disease. Some of these men exhibited enlarged cervical glands. They were tested by blood examinations, gland puncture, and, in one specially suspicious case, inoculation into a monkey (Cercopithecus), but with wholly negative results. Later they were sent for observation to Khartoum, and were re-examined, but no trypanosomes were found. The presence of these men at Taufikia, however, served to draw attention to what was undoubtedly a source of danger. Recruiting from Uganda has been abolished.

Lieutenant Gray (4) has shown that the country immediately south of Gondokoro is not of the kind likely to harbour *G. palpalis*, and neither Dr. Neave nor I saw anything of tsetse-flies on the Upper White Nile. As *G. morsitans* haunts the forest districts of the Bahr-el-Ghazal, there is nothing to prevent *G. palpalis* being likewise an inhabitant, and Dr. Neave's trip through that region may serve to settle this important question.[1]

(2) *The Disease in Cattle.*—Cattle trypanosomiasis has been studied in Khartoum, Melut, and Taufikia. The disease appears to be of a chronic nature, the principal symptoms being extreme anæmia, especially visible in the blanched, glistening, conjunctival surface, weakness, emaciation, running from the nose, and occasional dripping of urine. The last condition is probably dependent on muscular weakness. Plate III., fig. 1, gives a good idea of an animal suffering from the disease. Notice the dull, listless, half-closed and sleepy eye, the prominent ribs and hip-bones, and, what is rather constant, the atrophic line in the shoulder hump. In the later stages the head is held low, and towards the end there is complete collapse, the animal lying down and refusing to rise, the skin cold, the coat roughened, urine and fæces passed involuntarily, and the respirations noisy and rapid. At this stage the animal may take food, and, indeed, failure of appetite does not at any time seem to be a symptom. Careful examination failed to detect enlarged glands towards the root of the neck, but one is apt to be deceived by feeling the subcutaneous gelatinous exudation which is found to exist *post mortem*. The first ox from which specimens were obtained died some fifteen miles from Khartoum. Smears of the peripheral blood, liver and spleen were submitted to me by Captain Head. In all of these I found the small trypanosome since named *T. nanum* by Professor Laveran. Captain Head also brought in some of the cerebro-spinal fluid, which was centrifuged, and in the sediment streptococci, possibly due to contamination, and altered and amœboid forms of the parasite, were found. The latter resembled those described by Plimmer and Bradford (5) in bone-marrow in cases of nagana, and by Castellani (6) as occurring in the cerebro-spinal fluid in sleeping sickness. They were few in number and stained feebly. A somewhat pear-shaped, flagellated form was the most striking.

The second ox also died at a distance. In smears made from its blood trypanosomes were fairly numerous. The stomach, which has been placed in spirit, was the only organ brought to the laboratories. Attached to it was a small piece of omentum. On opening the stomach, a very curious condition of pigmented ulceration was disclosed, affecting the mucous membrane (Plate III., fig. 2). Scattered about were dark areas with thickened edges raised above the surrounding mucous membrane. The surfaces of these areas were flat and slightly depressed, and consisted of what was afterwards found to be altered blood clot. No smears were made from these areas, but sections were cut and examined. Beyond a severe bacillary invasion and the appearance of considerable

[1] Dr. Neave did not find *G. palpalis*, but it has been reported as existing at Wandi, in the Lado Enclave, and at Mvolo, in the Bahr-el-Ghazal. The report requires confirmation. I have recently heard that Major Bray, of the Egyptian Medical Service, has sent to Khartoum a specimen of a fly taken near Mvolo. It is believed to be *G. palpalis* by Captain Ensor, who examined it, and is my informant.

erosion and destruction of the mucous membrane, nothing was found.

The following are my notes on the condition :—

Examination of Abomasum or Fourth Stomach—Cardiac End.—Nothing noticeable externally. In a small piece of attached omentum there are two enlarged glands about the size of peas, rounded, elastic to the touch, purple in colour externally, and deep purple on section. The mucous membrane is of a uniform dark slate colour, no ecchymoses are present, but there are some dark patches, possibly due to *post-mortem* changes. Studded over the surface of the mucous membrane are spots of intensely black pigment (Plate III., fig. 2). Each of these, in most instances, seems to surround a tiny punched-out hole, and the pigmentation is most marked in the central depression. A few black granules can, as a rule, be squeezed out from the central pits. These granules were found to consist of altered blood. Where the patches are more advanced they present the appearance of ulcerations. Most of these are more or less circular and depressed, but some are in the form of ulcerated streaks, and all are intensely black. In addition there are a few patches of superficial pigmentation in which there is no ulcerative process.

Central Portion.—The condition is very similar, but the patches are larger, some of the ulcerated "streaks" being ¾ inch in length. In one or two places the ulcerations appear to have healed, leaving depressed and whitish scars surrounded by areas of slight pigmentation.

Pyloric End. — Nothing noted externally. The mucous membrane shows a general pigmentation of the surface in the form of little circular shallow pits with pigmented walls, the pigmentation being very slight. In addition, pigmented ulcers similar to those previously described are present in considerable numbers, and in some instances a regular plug of the black material fills up the ulcer, and rises above the surface of the mucous membrane. There are also present the superficial pigmentations already mentioned, some of which are associated with slight erosion. Where ulcers are marked their edges are thickened. The ulcerative process and the pigmentation are confined to the mucous layer. In no instance does perforation seem to have occurred. Size of largest ulcer, ¾ inch by ¼ inch.

At the time I did not think that these ulcerations, which rather recalled the lesions produced by the swallowing of a corrosive poison, were in any way connected with the trypanosomiasis. Since then I have had reason to alter that opinion, as will be seen when we consider the experimental work with the trypanosomes of mules. Lieutenant Gray, whom I met on his way to England from Uganda, informed me that he had recently found a similar condition of ulceration in the stomachs of natives dead of sleeping sickness.

The third ox is that shown (Plate III., fig. 1). The blood was taken at Khartoum on October 30th, and as many as two trypanosomes were found in some fields. The animal was kept and well fed. On November 4th fresh and stained blood films were examined, but no parasites could be demonstrated. Thereafter, though the blood was centrifuged and examined, and though the animal was subjected to four days' partial starvation, trypanosomes were not again found. Eventually, as the owner wished to slaughter the ox, it was exchanged for Ox No. 4, which was examined on November 23rd, when a considerable number of trypanosomes were found, as many as six per cover-glass preparation being present. This ox continued to show the parasites in its blood, and gradually became thinner and weaker.

On December 3rd it was found to be very weak, with marked anæmia and dribbling urine. The urine and fæces were examined for blood, but none was present. The fæces were slightly tarry in consistence, and this and their colour suggested the examination.

On December 4th the ox was found to be *in extremis*. Trypanosomes were slightly more numerous in the blood, and as it was feared the animal might die during the night it was slaughtered and an autopsy performed immediately.

The principal points noted were :—

(*a*) The extensive subcutaneous, gelatinous, and pale yellow exudation. Nearly every part of the subcutaneous connective tissue was in an œdematous, watery condition, which was most marked where the skin was loose, *i.e.*, in the dewlap, behind the shoulders and in front of the haunch.

(*b*) The presence of enlarged, purple, hæmorrhagic glands about the root of the neck.

(*c*) The great and general enlargement of the mesenteric glands, which were also, though to a less extent, hæmorrhagic in nature.

(*d*) The presence of a certain amount of chronic meningitis affecting the pia arachnoid, the pia being somewhat adherent to the surface of the convolutions. There was little thickening of the membranes, and no appearance of encephalitis; indeed, the brain appeared markedly anæmic. The stomach, which was distended with food, presented no ulcerative condition, but contained "bots" of a different kind to any I have seen in the Sudan. The intestinal tract was normal. There was nothing special to note with regard to the spleen and liver, which were neither congested nor enlarged. The heart's blood showed trypanosomes. Fluid from the lateral ventricles of the brain and from the cerebro-spinal fluid showed nothing in the way of trypanosome infection. Bile taken with aseptic precautions from the gall-bladder contained a short stout bacillus in considerable numbers, but no flagellated parasites.

The cow at Melut was picked out by the natives as being ill. The blood was collected in tubes containing citrate of soda solution. Such blood showed trypanosomes, though these were only found after some searching.

The Abyssinian cow which aborted at Taufikia, and was in a dying condition, also had trypanosomes in its blood, but they were not at all numerous. Time did not admit of a *post-mortem* examination in this case.

The trypanosome concerned is a small one. It is not very active in fresh films, and I have never seen one traverse the whole field of the microscope. The motion is undulating, combined with a vigorous slashing to and fro of the anterior part of the body, which tapers to a very tiny flagellum. Rippling and what

may be termed spreading movements have also been observed. The parasite advances usually with the narrow end in front, but this motion is often reversed, and I have seen one move a considerable distance, pushing aside the erythrocytes with its blunt posterior end. A fact which is very noticeable is that the trypanosome tends to adhere to the red blood corpuscles. Even in a thin field this is seen, the parasite seeming to take a delight in butting and boring at the erythrocytes. Frequently it gets beneath them and is lost to view, the agitation it produces being the only clue to its presence. Having studied this trypanosome, both in the living and stained condition, and having conducted a few inoculation experiments on laboratory animals (*vide infra*), I became convinced that this was either a new and undescribed trypanosome, or was identical with the parasite of cattle found by Bruce, Nabarro, and Gray, on the shores of the Victoria Nyanza in Uganda. Stained specimens were sent to the Liverpool School of Tropical Medicine, but I learn that unfortunately the stain had faded and could not be repeated with success. In the meantime I had sent unstained films to Professor Laveran, (7) to whom I am much indebted for his kindly interest, and who, in the *Proceedings of the Biological Society of Paris* of February 24th, describes the stained trypanosome, which he regards, provided further experiments prove it to be peculiar to cattle,[1] as a new species, and which, on account of its small size, he has named *T. nanum*.[2]

His interesting description of these parasites is as follows:—

"The trypanosomes measure 10 to 14 μ in length, by $\frac{1}{2}$ to 2 μ in breadth. Their structure is that of the flagellates of the genus *Trypanosoma*, although, contrary to the rule, the protoplasm is prolonged on the anterior part in such a way that there is no free part of the flagellum, or the free part of the flagellum is extremely short. The undulating membrane is very straight, and in consequence but little apparent. The posterior extremity is conical, not drawn out, and in other respects varies somewhat. The oval nucleus is situated near the centre of the body of the parasite. The rounded centrosome, rather large, occupies a position close to the posterior extremity. The protoplasm is homogenous without granules.

"Some forms a little longer than the others show two centrosomes and a flagellum, divided to a greater or less extent, proceeding from the centrosomic insertion."

He proceeds to point out how different in morphology is this trypanosome from *T. brucei* and *T. evansi*. He compares it with *T. theileri*, the giant trypanosome of South African cattle, and concludes by remarking that while very distinct from *T. theileri*, *T. nanum* approaches it in being peculiar to cattle, so far as is at present known.

I have little to add to the above description.

The photo-micrograph (Plate III., fig. 3), for which I am indebted to Dr. Beam, Chemist to the Laboratories, gives a very fair idea of *T. nanum*, multiplied 1,250 diameters. It shows it to be a short trypanosome with hardly any free flagellum visible, but is not quite typical, in that the posterior moiety is rather broader than is usually seen.

I append measurements I have made of a form whose total length was 14 μ.

From posterior end of body to centre of centrosome	1·2 μ
From centre of centrosome to nucleus ...	4·2 μ
Nucleus	1·6 μ
From nucleus to beginning of flagellum	5·6 μ
Free flagellum	1·4 μ
Breadth behind nucleus	2 μ

I agree that the protoplasm is homogeneous, though it sometimes stains irregularly, as evidenced (Plate III., fig. 3), while in forms kept *in vitro* granules appear, for the most part anterior to the nucleus. In such forms the vacuole in the neighbourhood of the centrosome may be found large and very evident. Sometimes a portion of the free edge of the undulating membrane is clearly visible, bunched, as it were, upon the back of the trypanosome, and looking like a loop. As a rule, however, the undulating membrane can scarcely be seen, save in the living parasite. I have worked with specimens stained by the Leishman-Romanowsky method, which answers admirably if the stain be strong and staining prolonged.[3]

I have carried out a few experiments *in vitro* which may be mentioned here, though the study of the trypanosome is yet far from complete, owing to lack of material and press of other work. Hence cultivation experiments have not yet been attempted.

In citrated blood kept at a temperature of 22° to 23° C. no change in the trypanosome was visible after twenty-four hours. They remained lively and stained well. After seventy-two hours at a temperature of 25° C. changes were observed to have occurred, the posterior ends of the parasites having become swollen, while the organisms were sluggish and evidently degenerating.

Trypanosomes disappeared in twenty-four hours from sterile citrated blood which had been exposed to a temperature of 16° C.

The trypanosomes from the Melut cow remained alive in non-sterile citrated blood at a temperature of about 35° C. for twenty-four hours. They underwent longitudinal division, forms with two centrosomes and two nuclei being seen. In these the undulating membrane was more apparent than usual.

Inoculation Experiments.—From Ox. No. 1, 0·5 cc. citrated blood, *i.e.*, about 0·25 cc. blood, was inoculated subcutaneously into a monkey (*Cercopithecus sabaeus*) on October 30th, 1904.

On the same date a rabbit received 1 cc. of citrated blood. These animals never show any symptoms of the disease, and though their bloods were repeatedly centrifuged in the hæmatocrit tubes, and carefully examined both in the fresh and stained condition, no trypanosomes were found.

From Ox No. 4, on November 23rd, a rabbit received 2 cc. of blood containing a considerable

[1] I have since found a very similar parasite in the blood of mules.

[2] *I.e.*, the "dwarf" trypanosome.

[3] Equal parts of thefluid stain and distilled water allowed to act for twenty minutes or even longer.

number of trypanosomes, six to the microscopic field (employing Leitz obj. 6, oc. 4, without ocular diaphragm), and a monkey (Cercopithecus) received 1 cc. The result in the case of these animals was also negative, though they remained under observation for two months.

On December 4th a brown pariah dog received 2·5 cc. of fresh blood subcutaneously at a time when trypanosomes were fairly numerous.

A black pariah dog received as food large pieces of the liver and spleen and several of the large glands, all soft food be it noted.

These experiments also proved absolutely negative.

On December 29th the last-mentioned rabbit happened to be killed accidentally. A *post mortem* was performed immediately, but no trypanosomes were found in the blood or in any of the organs. It would appear, then, that dogs, rabbits and monkeys (Cercopithecus) are not liable to infection with *T. nanum*. As it was desired to institute further experiments, the cow from Melut was brought to Khartoum, arriving there on March 4th, 1905, along with her calf. The blood of both animals was examined, but no trypanosomes were present.

In the case of the cow this fact, taken in conjunction with what was found in Ox 3, seems to prove that the parasites are in the habit of disappearing from the peripheral blood. Possibly spontaneous cure may occur.

The cow was in very poor condition, and presented all the symptoms of the disease, but repeated centrifuging of considerable quantities of blood failed to reveal the parasite. The animal has been under observation for nearly a month, and trypanosomes have never been demonstrated. Later examinations made down to the end of June all proved negative, and the animal being well fed, steadily improved in health and appearance. On March 7th, 1905, 4 cc. of the cow's fresh blood was inoculated subcutaneously into her calf. At the time of writing (March 27th, 1905) trypanosomes have not been found in the blood of the latter. Nor were they discovered up to the time of the last examination in June. The fact that, as a rule, there are not many parasites in the blood of cattle makes the investigation of *T. nanum* rather a tedious matter, and explains to some extent the imperfections of the research which has so far been conducted.

(3) *The Disease in Mules.*—For the study of trypanosomiasis in mules there have been available the stained slides of blood prepared by Captain Head from mules which were brought from the Bahr-el-Ghazal. The main source of material was, however, found in the three mules suffering from the disease at Taufikia. As stated, a dog was inoculated from one of these animals and brought to Khartoum, where it developed the disease. In the mule the chief symptoms of infection are the hanging head, the dull and listless eye, the roughened, staring coat, the prominent ribs, the general aspect of hopeless resignation, and the hind-leg projected from the body, a sign of weakness and giddiness. The blood of the mules seen at Taufikia literally swarmed with trypanosomes, and was thin, greasy, and difficult to spread on the slide. One animal died, but had decomposed before we got word of its decease. The death of a second enabled a *post mortem* to be performed. The most marked change was in the meninges, which were much thickened, the dura being very adherent to the skull. The brain was congested, and the cerebral vessels were gorged with blood. Elsewhere but little was found, the spleen not showing any increase in size or marked congestion. The liver was fatty. Unfortunately the stomach was not opened, a regrettable oversight on my part. It looked healthy viewed externally. There was no gelatinous, subcutaneous exudation, nor was the connective tissue œdematous. From the third mule the dog was inoculated, about 4 cc. being given subcutaneously on January 16th, 1905. On January 22nd trypanosomes were for the first time found in this dog's blood.

Slides of the mule's blood were sent to Professor Laveran, who describes the forms found in the same article as that in which he deals with *T. nanum*, the cattle trypanosome.

After remarking that the parasites were very numerous, he proceeded to distingush two types (fig. *A*):—

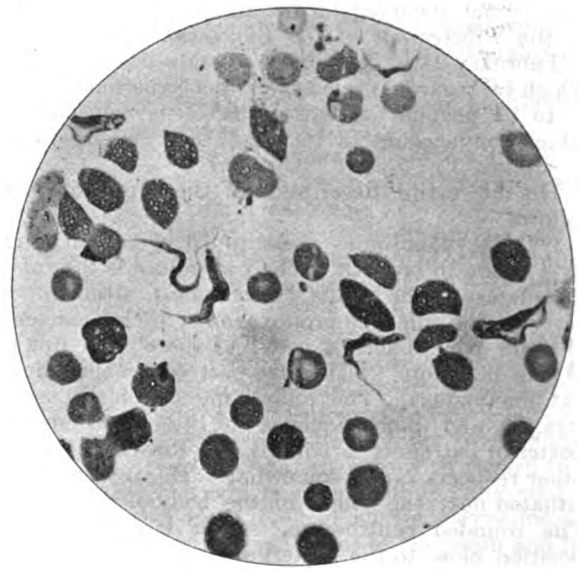


Fig. *A*.

(*a*) " Small forms measuring 12 to 14 μ in length, by $1\frac{1}{2}$ μ to $2\frac{1}{2}$ μ in breadth. These trypanosomes recall very much the appearance of the small forms of *T. dimorphum*. The protoplasm is prolonged as far as the extremity of the flagellum, which in consequence does not exhibit a free part. The undulating membrane is more developed than in *T. nanum*, but causes the parasite to present an even more ' stumpy ' aspect. The nucleus is situated sometimes in the centre, sometimes at the junction of the posterior with the middle third. The protoplasm contains chromatin granules, and these are sometimes very numerous. Forms in process of division are encountered with two centrosomes and one nucleus, two centrosomes and two nuclei, &c.

(*b*) " Large forms measuring 21 to 30 μ in length, by 2 μ in breadth. These forms, in which the flagellum

PLATE I.

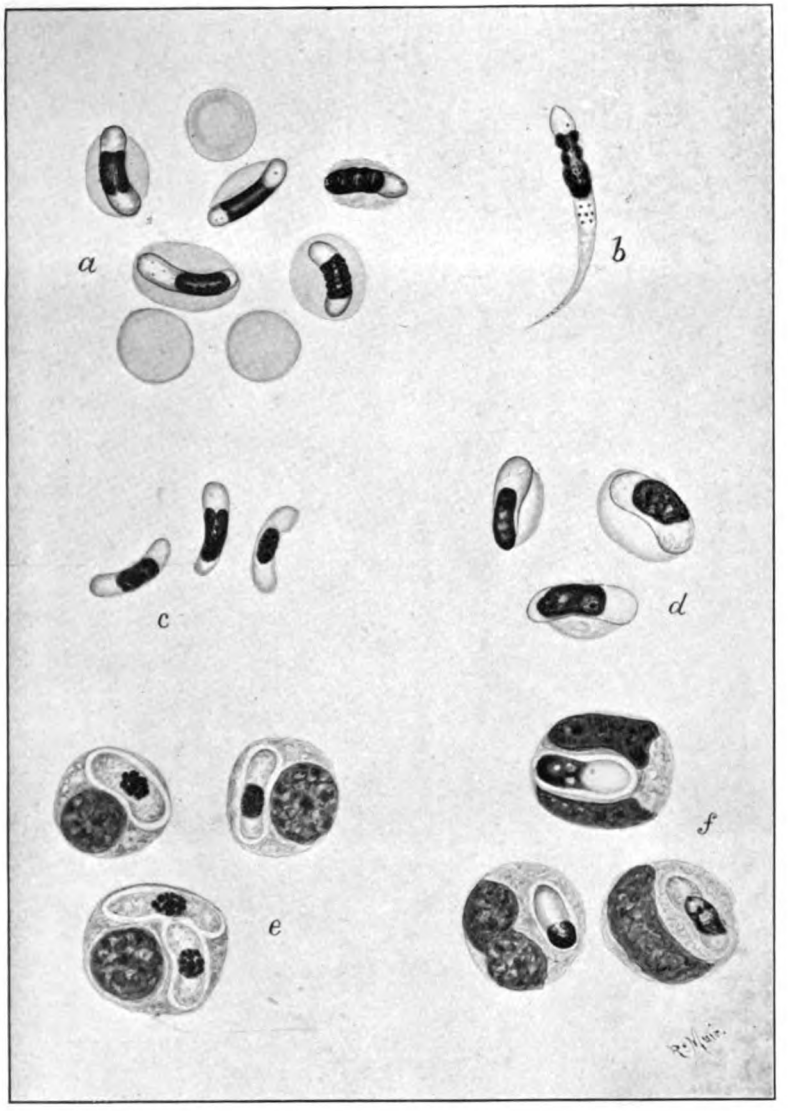
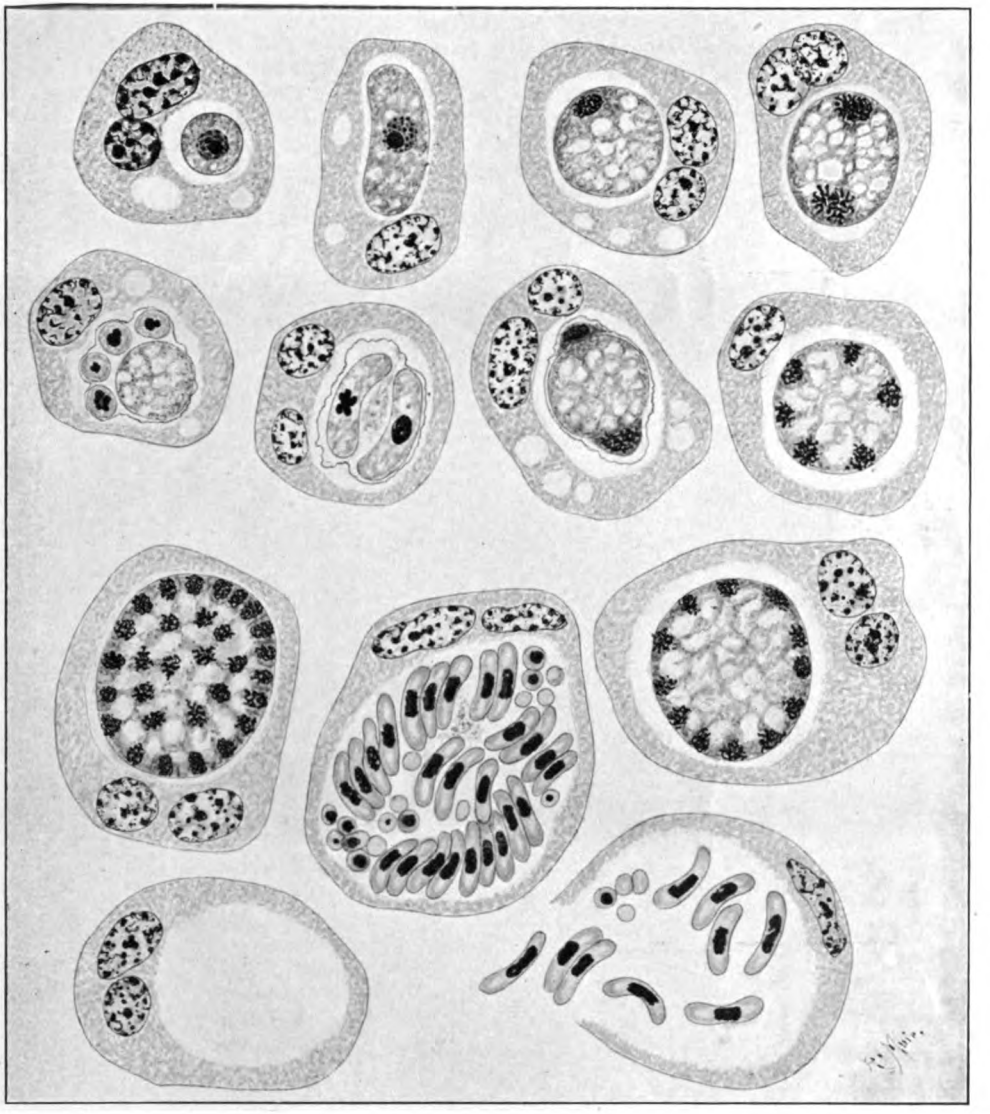


PLATE II.



To illustrate Dr. ANDREW BALFOUR'S article, "A Hæmogregarine of Mammals and Some Notes on Trypanosomiasis in the Anglo-Egyptian Soudan."

Baie & Danielsson, Ltd., London.

PLATE III.

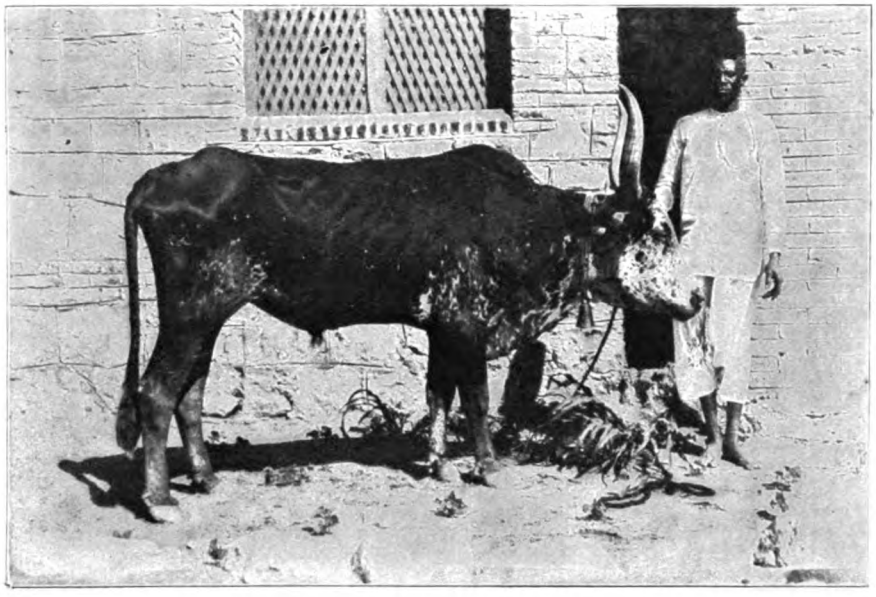


FIG. 1.

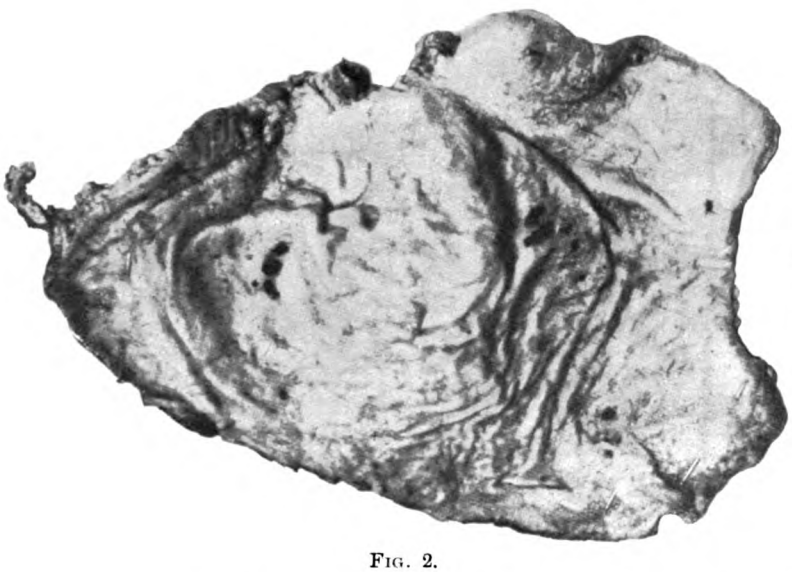


FIG. 2.

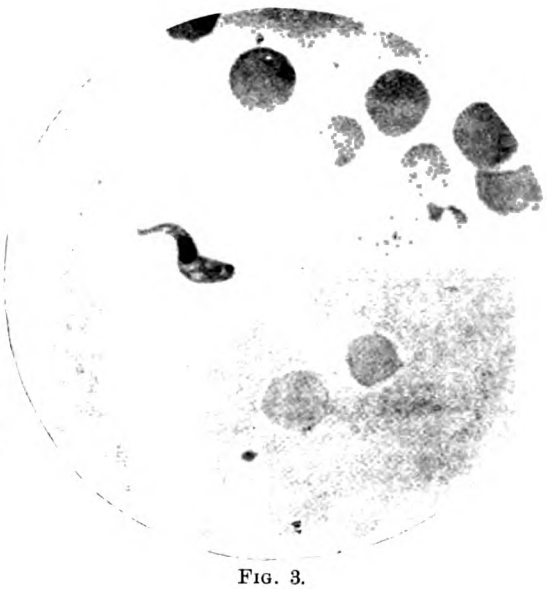


FIG. 3.

To illustrate Dr. ANDREW BALFOUR's article, "A Hæmogregarine of Mammals and Some Notes on Trypanosomiasis in the Anglo-Egyptian Sudan."

Bale & Danielsson, Ltd., London.

exhibits a very long free portion, bear a great resemblance to *T. evansi*. The posterior extremity is usually elongated, the protoplasm is homogeneous and with but few granules. Forms undergoing division by separation into two elements are found. It is to be noted that intermediate forms between the small and large trypanosomes are wanting."

From a study of numerous preparations, both fresh and stained, I am in a position to add a few additional notes to the above. In fresh blood both forms of trypanosome can be clearly made out. The long forms are much the more active, darting rapidly hither and thither, lashing vigorously with their flagella and displacing the red corpuscles. They can advance with either the anterior or posterior end in front, though their longer excursions are made with the flagellum "going on before."

Occasionally one of these long active forms may be seen to traverse the field of the microscope, but this is not common. The body of the trypanosome frequently

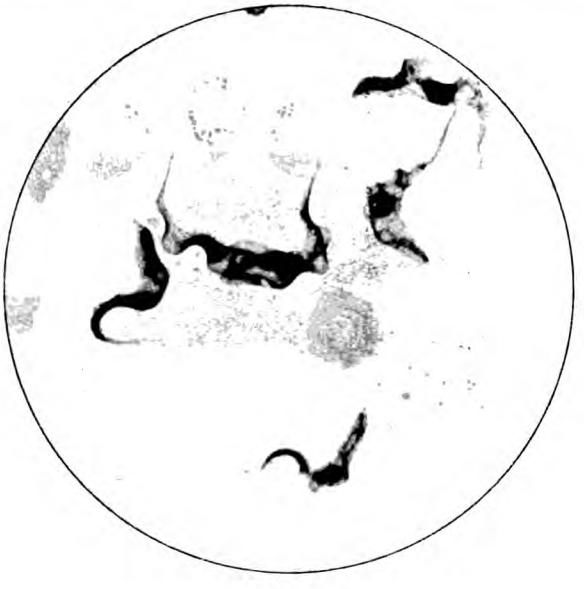


FIG. *B*.

bends upon itself, so that it presents the appearance of a tiny corkscrew for the fraction of a second—then stretching out, the parasite shoots across some space amongst the corpuscles, and plunges, writhing and lashing, amongst a startled group of erythrocytes. In the fresh state the undulating membrane is not very well defined in these long forms. They do not present a granular aspect. The short forms, on the other hand, are, as a rule, distinctly granular, and are more sluggish in their movements. They tend to hang about the same spot, and their excursions are limited, rather resembling those of *T. nanum*. They also can advance with either end in front, but their body movements are more of a rippling or undulating type. It often looks as though a series of shivers was running along the protoplasm. Their undulating membranes are well marked, and the rounded posterior ends are very distinct. On staining with Leishman-Romanowsky, used strong and for a considerable time, as in the case of *T. nanum*, the differences in structure between the two forms are well emphasised. Points to which Laveran, in his short note, does not refer is the well-known "pike-head" form of the posterior end of a typical long trypanosome, and the fact that the centrosome of the long form is not as large as that of the small. In some of the short forms the nucleus seems almost to touch the centrosome, while "bunching" of the undulating membrane is often well seen. I have noted curious forms, possibly distorted, with square-cut posterior ends, and more than once have seen a short form with no granules visible.

As a rule the granules are in the posterior moiety, *i.e.*, between the nucleus and the centrosome. In some instances the possession of these chromatin granules is almost the only point enabling one to distinguish this trypanosome from *T. nanum*. I have also noticed dividing forms, and it is not uncommon to find two short forms lying with their posterior ends in close contact, this being probably the terminal stage of a division (fig. *B*.).

In the mule's blood I did not observe conjugating or agglutinating or involution forms. I agree that the long forms measure from 21 μ to 30 μ, but some are as narrow as 1·4 μ at their thickest portion.

I append a very average set of measurements:—

From posterior end to centrosome ...	2·8 μ
From centrosome to nucleus	7 μ
Nucleus	2·8 μ
From nucleus to root of flagellum... ...	4·2 μ
Flagellum	6 to 10 μ

There is much variation amongst these long forms, but as a general rule the flagella stain admirably and complete measurements can easily be made.

Here are the figures for one of the short forms of a total length of 14 μ in which the nucleus was at the junction of the posterior and middle thirds:—

From posterior end to centrosome ...	1·4 μ
From centrosome to nucleus	1·4 μ
Nucleus (large)	2·8 μ
From nucleus to root of flagellum ...	7 μ
Flagellum	1·4 μ

I have found short forms to vary in length from 12 μ to 15·4 μ, and in breadth from 1·4 μ to 2·5 μ. As Professor Laveran points out in *T. dimorphum*, the trypanosome of horses in Senegambia, there also exist two forms, a long and a short. He asks if this and the mule trypanosomes are identical. He regards this as possible, but mentions the fact that while the short forms of the mule trypanosome resemble the short forms of *T. dimorphum*, the long forms of the former differ a little from those of the latter, mainly as regards the flagella, which as a rule are short in *T. dimorphum*. He adds, however, that variations occur, and that Dutton and Todd have described free flagella in the large form of *T. dimorphum*. Not only are they described but they are figured both in photo-micrographs and coloured plates, and I must say that my first impression was that I was dealing with *T. dimorphum*, or something very like it. To my mind the long forms more resembled the long forms of *T. dimorphum* than they did *T. evansi*, but then my comparisons were made from photographs and coloured drawings. Laveran

goes on to state another hypothesis, namely, that the mules may have been infected with two different species of trypanosome, and he cites the work of Cayalbon who, in the French Sudan, found horses to be the victims of a double infection (8).

There seems no reason why this might not occur as regards the short forms: one at once thinks of *T. nanum*, as the mules had come from the Itang district along with the herd of cattle amongst which was the cow harbouring those flagellates, and which aborted and died as already described.

In order to try and settle this vexed question, if possible, without proceeding to cultivation methods, and also to enable one to test certain therapeutic measures, animal inoculations have been conducted.

I do not propose to consider these in detail. Dogs, monkeys (Cercopithecus), gerbils, jerboas, rabbits and a goat were employed and numerous experiments were performed. As a result, I was led to think that these mule trypanosomes were really *T. dimorphum*, but this belief has been somewhat shaken by the discovery of a small trypanosome existing by itself in the blood of mules coming from the Bahr-el-Ghazal. It is difficult to be certain, and in any case the tendency is to follow Koch (9) and pay less attention to differences in species, and more to the presence or absence of pathogenicity.

(4) These inoculation experiments served to show how frequently ulceration of the gastric and to a less extent the intestinal mucous membrane was present *post mortem*. References to such a condition are not wanting in the literature. Dutton and Todd (10) found stomach lesions in a baboon dead of trypanosomiasis, while Musgrave and Clegg (11) record the presence of intestinal ulcers and ulcers in the cæca of animals dead of surra in the Philippines.

As a rule, however, attention does not seem to have been paid to the condition of the alimentary tract, and, as far as I know, when lesions have been noted smears have not been taken nor any further examination performed.

My number of *post mortems* in the cases of experimental animals now totals seventeen, and in nine of these gastric congestion or ulceration or both were present. In one case there was a marked ulceration of the cæcum and lower end of the ileum, in another Peyer's patches were congested. I do not think this can be a mere coincidence. A similar condition was found in the stomach of a Shilluk ox infected with *T. nanum*, and I am inclined to think, especially since hearing of Lieut. Gray's observations, that such lesions will be found to be common in trypanosomiasis.

As to their significance, one scarcely likes to hazard an opinion, but the thought that naturally arises is whether this condition may not indicate an effort on the part of the parasite to leave its host. Biting flies are regarded as the usual medium by which trypanosomes leave the body of an infected animal, though Rogers (12) has shown that the ordinary house-fly will serve the purpose in the case of open wounds, and fleas and other blood-sucking insects are effective as agents of transmission.

At the same the life-history of the trypanosomes of mammals is still obscure, and, so far as I know, despite the recent work of Koch at Ubebe, it has never been definitely settled whether or not they pass a stage in the flies or other insects which serve as carriers. I understand that Lieut. Gray's recent work in Uganda bears on this subject, but I have not had an opportunity of seeing it. It is, then, not possible that the parasite may escape from the body in some different manner? If so, may the gastric and intestinal lesions not be evidence of such exit? The condition found in cachexial fever due to the Leishman bodies will at once occur to any interested in this important subject. At the same time, we are immediately met with the argument that no one has ever found trypanosomes in the stools of infected animals, nor have such stools been definitely shown to be capable, on injection, of producing the disease. Lingard, it is true, states the contrary, but he is generally regarded as having been mistaken, and Musgrave and Clegg, who paid special attention to this point, deny that the stools can convey infection. Rogers also refutes Lingard's contention. In the face of all the evidence which has been accumulated and the absence of any experiments with the stools of inoculated animals, one is not justified in putting forward any theory.

(5) It is, however, interesting to note that on several occasions, both in the case of dogs and of monkeys, spirilla (fig. *C*) have been found in the blood clots

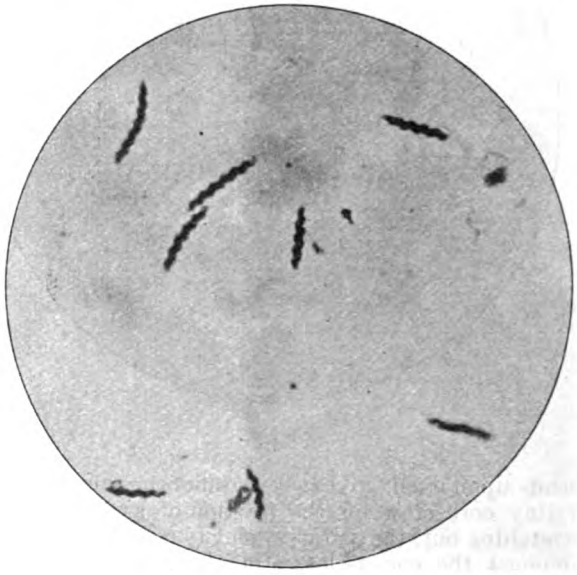


FIG. *C*.

covering the ulcers or in smears made from the ulcerated surfaces. These spirilla, which are somewhat blunt at the extremities, measure from 2·8 μ to 7·7 μ in length, are very actively motile, and possess from four to seven short undulations. There is a general impression found chiefly on Sohandium's (13) work, that trypanosomes and spirilla will be found to be very closely related, if they are not indeed merely different stages in the life of one parasite. Moreover, Theiler, in South Africa, has found trypanosomes and spirilla existing together in the blood of cattle, and Petri (14) has found the same thing in birds. The spirilla which I describe are short forms, and have not the typical

pointed ends of, say, *Spirochæte obermeieri*. For all that they are undoubted spirilla, and I have not found such present in the stomach or intestines of animals uninfected with trypanosomiasis. I think the observation is one of considerable interest. At present it is nothing more, but it seems worth while following up the matter.

(6, .7) The therapeutic value of chrysoidin and of blood serum. I propose to deal very briefly with these points in this paper. I was led to employ chrysoidin, a yellow aniline dye, and chemically the hydrochloride and di-amido-azo-benzene, because trypan red and malachite green had been used with some success, and because I had previously found chrysoidin (15) to be very lethal in dilute solutions to fish and to the ciliated embryo of *Schistosomum hæmatobium*. Further, I had found that it possessed, at least as regards fish, a special affinity for the central nervous system, staining the brain and spinal cord an intense yellow. I found the same to be true of the soluble form (chrysoidin extra), prepared by the Aniline Manufacturing Company, of Berlin, in the case of the gerbil (*Gerbillus pygargus*, Linn.).

For the most part I have used Merck's chrysoidin, ·1 grain of which in 10 cc. of distilled water constitutes a saturated solution.

Preliminary experiments *in vitro* showed that in a proportion of 1 in 500 it killed the trypanosomes of mules practically instantaneously, at the same time slightly colouring them. On staining such dead trypanosomes by the Romanowsky method they were found to take the colour badly and to have swollen posterior ends. They looked as if they had shrunk into themselves. In a strength of 1 in 6,000 some trypanosomes were observed to die in five minutes. Others though retaining their motility become rounded, and these also died after forty-five minutes. After four hours only one living trypanosome could be found. Though lively it had changed in shape and looked like an involution form. Although weaker mixtures, even 1 in 30,000, killed some of the parasites many were found to survive. In all cases controls were performed, and the blood was mixed with sterile citrate solution. No agglutination was observed. The dye was not so lethal as I had hoped, but I resolved to give it a trial, and employed it in the case of dogs, monkeys, and gerbils. Without entering into details, it may be said that as regards the trypanosome of mules the results have been somewhat disappointing. True the dye profoundly alters the parasites in the peripheral blood and sometimes causes their temporary disappearance, but I have been unable by its use to prolong the lives of infected animals or to greatly modify the course of the disease. It has been given subcutaneously and intravenously without marked smears, but it is worth while remembering that Laveran found *T. dimorphum* very resistant to the action of trypan red.

Dr. Neaves (16) employed chrysoidin in a case of human trypanosomiasis from Uganda, and found it caused the parasites, which were numerous, to disappear wholly from the peripheral blood and the juice of the affected cervical glands. I was able to confirm his observations, but succeeded in inoculating a monkey (Cercopithecus) by injecting several cc. of blood taken from a vein. The disease, therefore, was not cured, but the results have been somewhat hopeful, as the patient has greatly improved in condition (fig. *D*), and

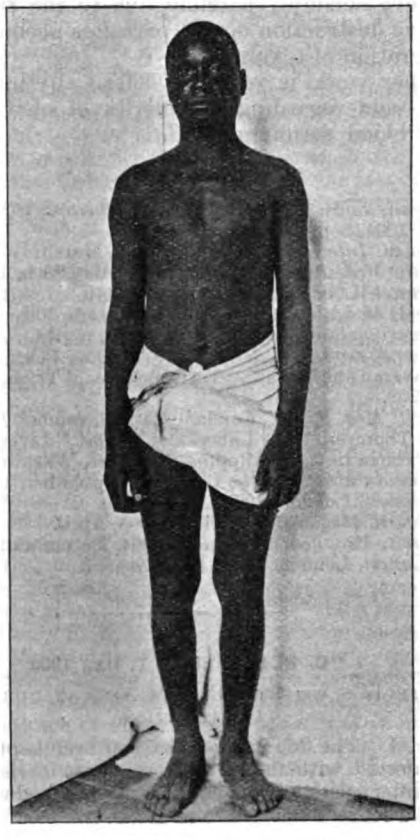


Fig. *D*.

chrysoidin does not cause the unpleasant staining of the mucous membranes which is one of the draw backs to the use of trypan red. The dye is easily given by subcutaneous injection, and, if it can so greatly diminish the parasites in the peripheral blood, may yet establish itself as a useful agent in preventing the transmission of the disease.

Dr. Neave proposed testing the therapeutic effect of the blood serum of wild animals from trypanosome-infected districts on experimental animals inoculated with trypanosomiasis. He sent me a sample of blood serum from a water-buck free of trypanosomes. It arrived in good condition, a small quantity of carbolic acid having been added to it as a preservative.

I proceeded to test it *in vitro*, and found that, added in equal quantities to citrated blood containing the trypanosomes of mules, it caused agglutination in the form of irregular rosettes, the motility of the trypanosomes composing the rosettes remaining. After thirty minutes there was marked agglutination. Disintegration and death of the parasites also occurred.

I employed the serum in varying doses in the case of monkeys and gerbils, and in some instances found that it produced a remarkable effect on the parasites, completely disintegrating them, so that on staining

nothing was to be seen except the centrosomes with flagella attached.

Here again, however, I have been unable to modify the disease or prolong life. Indeed, large doses of the serum have apparently hastened the end, producing convulsive seizures, possibly due to the sudden and extensive destruction of the parasites accompanied by the liberation of toxins.

Further work is required before anything definite can be said regarding the merits of chrysoidin and of this blood serum method.

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"C. R. Soc. Biol." T. lix., 1905.

INFECTION WITH THE NORTH AFRICAN SURRA BY COHABITATION.

Roger, J. The dog in question had been kept along with dogs infected with the equine trypanosomiasis of Algeria from January 25th to April 8th, but the method of contagion was not discovered.

"Annales de L'institut Pasteur," xix.

SOME ATTEMPTS TO CULTIVATE THE BACILLUS OF LEPROSY.

Neil, Emile M. P., claims to have cultivated the *B. lepræ* outside the human body but could not maintain his cultivations. More or less success was obtained with a variety of media, but the most successful was a bouillon made with 250 grms. of veal in 750 grms. sea-water and 250 grms. distilled water. Make distinctly alkaline, and add 40 grms. of glycerine, 8 of glucose, 10 of peptone and 20 of agar. Place in the cooler and add 1 part of yolk of egg to 4 parts of gelose in each tube.

"Journal of Hygiene," vol. vi.

FLAGELLATE PARASITE FOUND IN CULEX FATIGANS.

Ross, Major Ronald, C.B., F.R.S., recalls certain observations made by him in 1898 on certain "amœbulæ and flagellulæ," found in the intestines of mosquitoes, and suggests that the organisms found in mosquitoes by Schaudinn, and believed by him to be a stage of the *Halteridium danilewskyi* of the little owl may really be quite distinct parasites, having no connection with the avian hæmatozoon.

It is obvious, however, that it is equally possible that the protozoa referred to by Professor Ross may not, as he supposes, be purely mosquito parasites, but may really be a developmental stage of the hæmatozoa of some vertebrate. The question, however, may be safely left for the two distinguished protozoologists to discuss and settle between them.

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THE

Journal of Tropical Medicine

MARCH 15, 1906.

LIVERPOOL SCHOOL OF TROPICAL MEDICINE.

REPORT FOR 1905.

THE Seventh Annual Report of the work of this School shows that it continues to fulfil, in an eminently satisfactory and creditable manner, the purposes for which it was founded.

Whether regarded from the point of view of the practical and scientific training it affords to a large number of medical men, or the yet higher platform of original research, the School authorities have every reason to be satisfied and proud of their achievements. The publications emanating from the School have advanced our knowledge in many directions, and enhanced the reputations of the several contributors.

The "Mary Kingsley Medal" has been bestowed by the School authorities upon Sir Patrick Manson, K.C.M.G., F.R.S.; Colonel David Bruce, C.B., F.R.S.; Dr. Laveran, and Professor Koch. The Liverpool School of Tropical Medicine has sent out expeditions to several parts of the Tropics, costing some valuable lives, and involving the expenditure of large sums of money. So important have these expeditions proved that the publication of a complete list of the several

undertakings is deemed worthy of being reproduced, as a testimony of their consequence and of the success attending them.

EXPEDITIONS.

The First (Malarial) Expedition: Major Ronald Ross, C.B., F.R.S., Dr. H. E. Annett, Mr. E. E. Austen (of the British Museum) and Dr. Van Neck (of Belgium), despatched to Sierra Leone in the summer of 1899.

The Second (Malarial) Expedition: Dr. R. Fielding Ould, despatched to the Gold Coast and Lagos, in the winter, 1899.

The Third (Malarial) Expedition: Dr. H. E. Annett, Dr. J. E. Dutton and Dr. Elliott, despatched to Northern and Southern Nigeria in the spring of 1900.

The Fourth (Yellow Fever) Expedition: Dr. H. E. Durham and the late Dr. Walter Myers, despatched to Cuba, and to Para in Brazil in the summer of 1900.

The Fifth (Sanitation) Expedition: Major Ronald Ross, C.B., F.R.S., and Dr. Logan Taylor, despatched to Sierra Leone in the early summer of 1901.

The Sixth (Trypanosomiasis) Expedition: Dr. J. E. Dutton, despatched to the Gambia in the autumn of 1901.

The Seventh (Malarial) Expedition: Dr. C. Balfour Stewart, despatched to the Gold Coast in November, 1901.

The Eighth (Sanitation) Expedition: Major Ross, despatched to Sierra Leone on February 22nd, 1902.

The Ninth (Malarial) Expedition: Major Ross, accompanied by Sir William Macgregor, K.C.M.G., the Governor of Lagos, despatched to Ismailia, September 11th, 1902.

The Tenth (Trypanosomiasis) Expedition: Dr. J. E. Dutton and Dr. J. L. Todd despatched to the Gambia and French Senegal on September 21st, 1902.

The Eleventh (Sanitation) Expedition: Dr. M. Logan Taylor, despatched to the Gold Coast from Sierra Leone on October 11th, 1902.

The Twelfth (Trypanosomiasis) Expedition: Dr. J. E. Dutton, Dr. J. L. Todd, and Dr. C. Christy, despatched to the Congo Free State on September 23rd, 1903.

The Thirteenth Expedition: Professor Rupert Boyce, M.B., F.R.S., Dr. Arthur Evans, M.R.C.S., and Dr. Herbert H. Clarke, M.A., B.C.Cantab., were despatched to Bathurst, Conakry and Freetown on November 14th, 1904, to report on the Sanitation and Anti-malarial Measures in practice at the towns visited.

The Fourteenth Expedition: Lieut.-Col. G. M. Giles, M.B., F.R.C.S., Indian Medical Service (Rtd.), and Dr. R. Ernest McConnell, M.D. (Canada), despatched to the Gold Coast on December 31st, 1904.

The Thirteenth and Fourteenth Expeditions were sent to West Africa in appreciation of Sir William MacGregor's great services to health and sanitation in West Africa.

The Fifteenth (Yellow Fever) Expedition: Dr. H. Wolferstan Thomas and Dr. Anton Breinl, despatched to the Amazon in April, 1905. Both members of the Expedition contracted yellow fever and Dr. Breinl had to be invalided home.

The Sixteenth (Yellow Fever) Expedition: Professor Boyce, F.R.S., despatched to New Orleans in August, 1905, to observe the work of the United States Medical Authorities in dealing with the outbreak of Yellow Fever there. Professor Boyce subsequently visited British Honduras at the special request of the Colonial Office, to make a report on the conditions existing in that Colony with reference to a recent outbreak of Yellow Fever.

The paragraph in the Report referring to the death of Dr. J. E. Dutton, whilst engaged upon scientific work on the Congo, is a fitting testimony to a distinguished man who lost his life in the cause of humanity.

THE LATE DR. J. E. DUTTON.

It was with the deepest regret that the Committee learned of the sudden death of Dr. Dutton, Walter Myers Fellow, at Kosongo, on the Congo, on February 27th, while actively engaged in the investigation of trypanosomiasis and tick fever. In 1903, Dr. Dutton, accompanied by Dr. Todd, proceeded to the Congo to investigate trypanosomiasis and other tropical diseases. Towards the end of 1904 they had reached Stanley Falls, and independently they were able to demonstrate the cause of tick fever in man—a discovery made a few weeks previously by Ross and Milne in the Uganda Protectorate. Further, they were able to prove the transference of the disease from man to monkeys by means of a particular species of tick. During these investigations both observers contracted the disease. The last letter received from Dr. Dutton was dated Kosongo, February 9th, when he seemed in excellent spirits. In his death, the Tropical School and the University have suffered the loss of a most brilliant graduate. Although only twenty-nine years old, he had already won a recognised position throughout the scientific world.

Educated at the King's School, Chester, Dr. Dutton proceeded to the University of Liverpool, where he rapidly made his way, and in 1897 he was appointed to the George Holt Fellowship in Pathology, which gave him the opportunity for research. Dr. Dutton entered the Royal Infirmary, where he acted as house surgeon to Professor Rushton Parker and house physician to Dr. Caton. In 1901 he was elected to the Walter Myers Fellowship in the Tropical School. His first expedition to West Africa took place in 1900 when, with Dr. Annett, he visited Nigeria. In 1901 he proceeded alone to the Gambia, and drew up a most comprehensive and useful anti-malarial report which has proved of the greatest service to that colony. It was during this expedition that he identified in the blood of a patient of Dr. Forde, the Medical Officer of Bathurst, a trypanosome belonging to a group of animal parasites which had hitherto been found only in animals. He accurately described and named it. Subsequently he found the same organism in numerous other patients in the Gambia and elsewhere. It can hardly be doubted that this brilliant discovery of the first trypanosome in man by Dr. Dutton was an important step in leading to the discovery of the cause of sleeping sickness, which was subsequently shown by other observers to be due to the same parasite. In addition to his discovery of *Trypanosoma gambiense*, he also described several other trypanosomes new to science. In 1902 he proceeded with Dr. Todd to Senegambia, and drew up a report on sanitation, which was presented to the French Government, and further papers on trypanosomiasis which were published. The present expedition to the Congo was sent out in 1903. Dr. Dutton was accompanied by Dr. Todd and Dr. Christy, the latter returning to England in June last.

It will be seen from this account that, although only twenty-nine, Dr. Dutton had accomplished a vast amount of useful work, and had advanced in a most striking manner our knowledge of medicine. Medical science has lost one of its most promising and distinguished men. The City of Liverpool mourns the loss of one of its most gifted students, and his colleagues in the University and the Royal Infirmary have lost one who combined with a great intellect a charming personality, which made him beloved by all.

About 900 cases of various tropical diseases have been treated at the special ward of the School in the Royal Southern Hospital since the School's opening, including cases of sleeping sickness. Students receive their clinical instruction in this ward.

Students to the number of 150 have already taken out the course of instruction. These students have been medical officers of nearly every nationality, and in almost every case have been men holding responsible official positions in tropical countries, who have realised the value of what may still be considered as a new departure in medical research.

Reviews.

LECTURES ON TROPICAL DISEASES. Being the Lane Lectures for 1905. Delivered at Cooper Medical College, San Francisco, U.S.A., August, 1905. By Sir Patrick Manson, K.C.M.G. London: Archibald Constable and Co., 16, James Street, Haymarket, S.W. 1905. Pp. 230. Illustrated. Price 7s. 6d.

Every medical man interested in tropical medicine will welcome this volume. It is needless to say that the subject is presented in that fascinatingly educative style of which Sir Patrick Manson is master. Not only are the several diseases described with accuracy as regards their pathology, etiology, prophylaxis and therapeutic treatment, but from the first to the last page the subject matter is presented in a form which teaches one to regard tropical pathology, and all that appertains to it from the higher platform of public health and racial welfare. Of the ten chapters, under which the lectures are arranged, the first six are devoted to descriptions of such diseases as Epiphytic Disease of the Skin, Ankylostomiasis, Dracontiasis, Endemic Hæmoptysis, Bilharziosis, Filariasis, Malaria, Trypanosomiasis and Sleeping Sickness; Kala-Azar and other diseases of lesser importance in regard to their epidemicity. Chapters VII. and VIII. deal with the Diagnosis of Tropical Fevers; Chapter IX. is concerned with Treatment. The last chapter is the one to which medical men, acquainted with tropical ailments, will turn, namely: "Problems in Tropical Medicine." Under this heading the reader will find a wealth of suggestions and scientific deductions which must prove stimulating to thought and research. Yellow Fever, seeing that the lectures were delivered to an American audience, naturally occupies considerable space in the matter of "Problems," but the treatment of this subject has direct bearing upon the principles to be followed in research in other diseases and in other countries. Sir Patrick, discussing the Creole immunity to yellow fever, adopts "as a working hypothesis that there are two strains of yellow fever virus, one of great virulence, one of little virulence. Specifically the same, they are mutually protective. They differ only in their respective pathogenicity. The relationship pertaining between them recalls that between small-pox and vaccinia, and the native in the endemic area acquires his immunity against the virulent disease from having had the non-virulent disease already." It is useless, however, attempting to quote jottings from a book which is a consecutive whole, and every word of which is interesting, educative, and a stimulant to the pursuit of research and observation. The book will remain a classic, long after many of the subjects it deals with are further elucidated, for the store of knowledge it embraces and the suggestions as to future investigations it contains are no mere ephemeral speculations, but deductions founded on a logical basis which increased knowledge may prove to correct but cannot upset.

THE WEST AFRICAN POCKET BOOK.

The West African Pocket Book is a happy idea. It is not merely in name but in form and style a pocket book which any one travelling can always carry about in the pocket. We have nothing but praise for its contents. It is intended as a guide for newly appointed Government officers, and has been compiled by direction of the Secretary of State for the Colonies. Within fifty-nine pages it gives concisely and in simple language excellent information and directions as to outfit, personal hygiene, food and drink, care of quarters, travelling and bush life, precautions to be taken against malaria, and treatment of some of the more common diseases and accidents when the help of a medical man cannot be obtained. The pocket-book is worthy of every commendation, and the Colonial Office are to be congratulated on its issue. It is to be obtained from Waterlow and Sons, London.

Correspondence.

THE TEETH OF CENTRAL AFRICAN NATIVES.

To the Editor of the JOURNAL OF TROPICAL MEDICINE.

SIR,—In your issue of October 2nd last there are some remarks by a Dr. G. A. P. Ross on the teeth of Central African natives. I did not see the article to which he refers; I have not long been a subscriber to your Journal.

I beg to correct the following statement with reference to the Angoni tribe: viz., "Their food is entirely vegetable, consisting of rice, mealies, and ufa (mealies and Kaffir corn mixed.)"

Probably the older of the men he examined had never heard of rice in their boyhood. Until a few years ago rice was only grown at one station on the western shore of Lake Nyassa, where its cultivation was probably started (and certainly encouraged) by H.M. Administration.

The Angoni are almost entirely confined to the highlands, where they can hardly grow rice, so it must be rarely that rice enters into the Angoni villager's diet. Of course as a European carrier rice would be the usual ration.

Presuming "mealies and Kaffir corn" to mean Indian corn and millet respectively, it does not follow that because these are their ordinary food that they take them mixed and call it "ufa," as the writer states. "Ufa" is simply the native name for flour, and may be made from maize, millet, or other smaller native grain. This flour, with beans, vegetable marrows, wild green herbs, and whole maize roasted as a cob in the embers of a fire, or as separated grains on a shovel, like coffee-beans often are, is the daily dietary of natives in the villages.

Again, they are not vegetarians from choice: they keep goats and pigs, and some have sheep and cattle, while their poultry sleep in their houses with them; and not only do they eat meat whenever they can get it, and eagerly join a shooting party as carriers, but one may often see a gang of Angoni labourers after the day's work hunting the grass for field rats and mice for the evening stew-pot, and Europeans' cats often disappeared for the same purpose.

It will be seen, therefore, that it is rather because practically the whole grain is eaten by natives, and to their care of the teeth, than to absence of meat from their diet, that must be held to account for the high percentage of good teeth amongst Central African natives.

I am, &c.,

East Africa, J. E. S. OLD, M.D.
February 6th, 1906.

ABSENCE OF FEVER IN QUARTAN MALARIA.

To the Editor of the JOURNAL OF TROPICAL MEDICINE.

DEAR SIR,—Reading the interesting remarks of Dr. Wellman in your issue of February 1st ult., concerning absence

of fever in quartan malaria, the following observations may be of interest.

This country varies enormously in the malarial index in different parts, the index being 100 per cent. to 80 per cent. in low-lying, wet situations and in parts of Jerusalem; in the upland villages Ramallah, for instance, the splenic index, is only 4·3 per cent. (in 232 children, 10 years and under).

(1) A Jewish woman, showing quartan rosettes in the peripheral blood *in hospital*, had had no fever for several days; the spleen was considerably enlarged, and there was well-marked cachexia.

(2) A girl of 12 years or so, after severe attacks of fever, denied any rise of temperature for over two months; she was very cachectic, had enlarged spleen, and showed numerous pale rings and crescents in the blood.

(3) Two other patients, showing sparse quartan and tertian parasites, had had no fever for *ten* and *twelve days* respectively.

(4) A healthy European, engaged in archæological work, on *the first day of fever* showed numerous tertian forms, including spores and equally numerous gametes. This leads to an interesting query as to the date of appearance of gametes in tertian fever; so far as I have seen, crescents are not seen until seven days from onset of fever. This patient had had no fever for months to my knowledge.

Another point of interest is, that whereas malaria is very little in evidence in winter (one case per diem or less), almost all of these have proved to be quartan in character under the microscope, and Dr. Masterman, working in Jerusalem, has noted the same in a marked manner, from clinical evidence. In this country there would seem to be no preponderance of tertian fever in spring, as in Italy, or of subtertian malaria in autumn, when tertian fever is commonest.

I am, yours faithfully,

Ramallah, Jerusalem,
February 15th, 1906.

JOHN CROPPER.

Drugs and Remedies.

PREPARATIONS BY MESSRS. PARKE DAVIS AND CO., 111, QUEEN VICTORIA STREET, LONDON.

(1) *Fluid Extract of Cassia Beareana.* — This species of cassia, introduced by Dr. O'Sullivan Beare, has obtained considerable reputation as a therapeutic agent in the treatment of blackwater fever and of ordinary malaria. Messrs. Parke Davis have prepared a fluid extract which ensures stability of dosage and portability without deterioration.

(2) *Antimalaria Tablets.*—Each tablet contains: quinine sulph., 3 grains; powdered nux vomica, gr. ¼; powdered capsicum, gr. ½; and extract of hyoscyamus, gr. ½. The components of this tablet are eminently suitable for tropical residents; the introduction of capsicum harmonises with the ideas entertained by native practitioners in the Tropics as to the virtues of "spices" in decoctions prepared by them.

(3) *Warburg's Tincture Tablets.*—Each tablet represents a fluid drachm of the Warburg's well-known tincture. There can be no doubt of the efficacy of Warburg's tincture in the treatment of febrile ailments in tropical countries, more especially when marked gastro-hepatic derangements accompany the illness. Its efficacy in remittent malaria is undoubted.

(4) *Acetozone* in solution is powerfully germicidal, and possesses the advantage of being non-toxic. At the strength of 1 in 1,000 in typhoid, 1 in 2,000 in dysentery and cholera, and 1 in 3,500 in intestinal fermentation, acetozone has proved highly beneficial.

(5) *Hæmabic Hypophosphites* is an elegant preparation, palatable and suitable in debility and anæmia, especially when these are the result of acute and subacute illnesses.

Notes and News.

BERMUDA.

The Medical Board appointed to enquire into the medical qualifications of persons desiring to register as medical practitioners in Bermuda consists of: Eldon Harvey, F.R.C.S.Eng., L.R.C.P.Edin.; Dudley Cox Trott, M.B., B.C.Cantab., F.R.C.S.Eng., &c., &c.; and William Eldon Tucker, M.B., B.C. Cantab., &c.

PLAGUE.

PREVALENCE OF THE DISEASE.

		Cases.	Deaths.
India.—Week ended	Jan. 27th	—	3,747
,,	Feb. 3rd	6,116	5,042
,,	,, 10th	7,116	5,890
S. Africa.—Week ended	Feb. 3rd	0	0
,,	,, 10th	0	0
Mauritius.—Week ended	Feb. 8th	1	1
,,	,, 15th	1	1
,,	,, 22nd	0	0
,,	,, 29th	0	0
Hong Kong.—Week ended	Feb. 3rd	2	2
,,	,, 10th	6	6
,,	,, 17th	5	4
,,	,, 24th	12	12
,,	March 3rd	8	7

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

Sec. I., "Kwai Medical Journal," Johan, December 31, 1905.

EXPERIMENTS ON DOGS DURING KAK'KE (BERI-BERI) INVESTIGATIONS.

Baron Takaki fed three dogs on vegetable diet (including rice) and three dogs on a diet containing beef. The dogs fed on vegetables only increased in weight markedly at first, but later became thin, feeble, lost sensation and motion in the hind limbs and died. The dogs fed on beef and vegetables gained in weight more slowly and remained healthy and strong. Takaki concludes that increase in weight is no evidence of health.

"Semaine Médicale," September 13, 1905.

MALARIAL PERITONITIS.

Gillot, V., describes a case of acute peritonitis occurring in a patient in whom the malaria parasite was found in the blood. The peritonitis yielded to treatment by quinine.

"Presse Medicale," December 30, 1905.

OVA IN THE INTESTINAL PARASITES; TECHNIQUE OF OBSERVATION.

Letulle, M., recommends for the diagnosis of the presence of ova in the fæces, that (*a*) in the case of a fluid stool, after centrifugalisation a drop of sediment is taken for examination; (*b*) solid fæces are first dissolved in water, and then treated as in the case of a fluid stool. The ova possible to isolate in this manner are those of (1) *Ascaris lumbricoides*, (2) *Oxyuris vermicularis*, (3) *Bothriocephulus latus*, (4) *Trichocephalus dispar*, (5) *Ankylostoma duodenalis*, and (6) *Bilharzia hæmatobium*. In his paper, Letulle gives careful drawings of the ova of these parasites.

"American Journal of Medical Sciences," January, 1906.

Thomas, J. B. Report on the action of various substances on pure cultures of the *Amœba dysenteriæ* and cholera spirilla. The following laboratory experiments by Thomas are interesting, and may be of clinical value:—

(*a*) The following retarded the growth of *Amœba dysenteriæ* and cholera spirilla in thirty minutes: Acid tannici, 1 in 100; quinine sulph., 1 in 1,000; cupri sulph., 1 in 2,000; potassium permanganate, 1 in 4,000.

(*b*) Retarded the growth within thirty minutes: Quinine sulph., 1 in 500; protargol, 1 in 500; argyrol, 1 in 500; potassium permanganate, 1 in 2,000; argenti nitrate, 1 in 2,000.

(*c*) Destroyed amœba in fifteen minutes, with only slight effect on cholera spirilla: Thymol, 1 in 2,500.

"Gazetta Degli Ospedali edelle Cliniche," January 7, 1906.

Conti, A. A clinical note in a case of chronic spasm of the region of the accessory nerve of Willis due to malaria.

"Journal American Medical Association," February 3, 1906.

(1) Wilkinson, H. B. "Leprosy in the Philippines, with an Account of its Treatment with the X-rays." Wilkinson finds that treatment of one leprous spot produces improvements in spots in other parts of the body which in their progress advance parallel to and just as complete as in the spot exposed to the X-rays. He therefore assumes that the leprosy bacilli are killed by the treatment, and that their bodies, reabsorbed into the blood, are the immunising and curative factors. He finds the more pronounced the cure the better does the X-ray treatment serve—a phenomenon he explains by the fact that the more pronounced the disease the more bacilli are present, and, therefore, the more immunising agents, in the form of dead bodies of bacilli, are produced. A parallel immunisation is that provided in plague by using injections containing the dead bodies of the plague organisms; in the case of leprosy, however, as treated by X-rays, the culture medium is not produced in the laboratory, but is no other than the human body itself.

(2) Gorgas, W. C. "Mosquito Work in Relation to Yellow Fever in the Isthmus of Panama."

"Arch. f. Protistenk.," T. vi.

REPRODUCTION OF CLEPSIDRINA OVATA.

Schnitzler, H., continues the work of Pähler on the same species of gregarine, and concerns himself mainly with the details of the changes undergone by the nucleus after the encystment of the coupled adults. He describes the formation of a very small spindle of division in each nucleus when all the chromatin and the nuclear membrane have disappeared, and also the mitoses of the reproductive nuclei during division. He confirms, with further details, Pähler's description of the phenomena of nuclear reduction by the throwing out of a polar globule which characterises the maturation of the sporoblasts or gametes (a unique instance amongst the gregarines). Lastly, he figures and describes the isogamic reproduction of the gametes in pairs. Each couple gives origin to one of the cask-shaped sporocysts with eight sporozoites, which is a characteristic of the genus *Gregarina*.

He was, however, unable to work out the evolution of the other form of cyst which is formed by a single gregarine, but suggests that the difference in the size of the sporocysts is connected with these solitary encystments.

"Arch. Zool. Expér.," 4th Series, T. iv., 1905.

RESEARCHES ON THE REPRODUCTION OF THE MONOCYSTID GREGARINES.

Brasil, Louis, follows the development of these parasites from encystment to the formation of the sporocysts. He states that, at any rate, in the four species of Monocystis found in earth-worms which he has examined the gametes are anisogamic. In this they resemble two others of this genus infesting the body cavity of certain marine annelids. The author describes with great care the origin and structure of the asters, their division into two, the formation of the directive spindles, the elimination during the first division of a great part of the nuclear chromatin and the division of the residual chromatin amongst the daughter nuclei.

"Sitzungsber d. K. pr. Akad. d. Wiss.," T. xlvi., 1905.

SPECIFIC DISTINCTIONS BETWEEN TRYPANOSOMES.

Koch, Professor R., draws attention to the difficulties of distinguishing between trypanosomes generally, and especially of those that act as pathogenic organisms in mammals. Their pathogenic character cannot, however, be used to distinguish them, as the animal employed in such a test might have acquired immunity. The key of the difficulty, he believes, lies in comparing not merely the adult forms, but the various evolutionary stages which they undergo, As an example, he compares the evolutionary stages of *T. brucei* in *Glossina morsitans* and *G. fusca* with that of *T. gambiense* in *G. palpalis*. In both cases there are found in the digestive tubes of flies that have imbibed infected blood two very distinct forms: the one sort plump, with abundant, easily stained plasma and a round, spongy nucleus; the other elongated and thin, with scanty, ill-staining protoplasm and a dense, rod-like nucleus. Judging from analogy, the former are the female and the latter the male elements. Now the two species can easily be distinguished as follows:—

Female Forms.—T. brucei: Blepheroplast or centrosome round, and about 1 μ in diameter. *T. gambiense:* Elongated transversely, and 2·5 μ 5 by 1·5 μ.

Dimensions.—Female forms: *Brucei*, 25 μ by 3·6 μ; *gambiense*, 37 μ by 3 μ. Male forms: *Brucei*, 40 μ by 2·1 μ; *gambiense*, 34 μ by 0·85 μ.

"C. R. Soc. Biol.," T. lix.

FREQUENCY OF TRYPANOSOME INFECTION IN RATS AND MICE.

Sabragès, J., and Muratet, L. All the specimens of *Mus rattus* examined at Bordeaux were found to be infected, but none of those of *M. decumanus* or of mice. On the other hand, a big *M. decumanus* taken at Tours was found to be infected.

Notices to Correspondents.

1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the JOURNAL OF TROPICAL MEDICINE should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communications.

ON A HEMIPTEROUS INSECT WHICH PREYS UPON BLOOD-SUCKING ARTHROPODS AND WHICH OCCASIONALLY ATTACKS MAMMALS (MAN).

By F. C. Wellman, M.D.

Benguella, West Africa.

Some months ago I mentioned (1) an insect, called by the Angola Bantus "*Ochindundu*," which preys upon blood-sucking ticks. The specimen upon which I based my remarks was taken in the act of feeding upon a very important tick of the region (*Ornithodoros moubata*) which is one of the carriers of human spirillosis. I have since learned that the insect itself inflicts a very painful and even dangerous bite. The specimen was sent to the British Museum, but, having heard nothing of it, I suppose it must have been lost *en route*. Since I have on several occasions referred to the insect (2), I shall here give (as well as I can in the absence of the anticipated report from the Museum and without access to a library) a few notes on the appearance, probable systematic position, bionomics, and pathologic significance of the animal.

Systematic Position and Description.

The insect under consideration belongs to the *Hemiptera* (Bugs) falling among the *Heteroptera*. Here it is to be placed with the *Geocores* (Land bugs), thus allying it with bed-bugs, squash-bugs, &c. It belongs to the family *Reduviidæ* (3). This family is related on the one hand to the *Nabidæ*, and closely on the other to the *Emesidæ*. The *Reduviidæ* are distinguished by having the front femora somewhat thickened, but much less than half as wide as long. Two ocelli are often present. The rostrum is short, three-jointed, attached to the tip of the head, and with the distal end, when not in use, resting upon the prosternum, which is grooved to receive it. The species are many. While I, of course, cannot definitely place

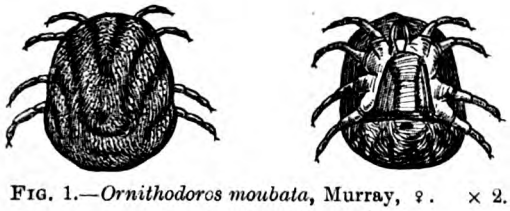


Fig. 1.—*Ornithodoros moubata*, Murray, ♀. × 2.

the species studied by me without access to descriptions and specimens of its allies, yet I have no hesitation in saying that it closely approaches *Reduvius* (*Opsicaetus*) *personatus*, *L.* I have no description of *R. personatus* by me, but my impression is that the first two pairs of legs in the last-named bug are less thickened than in the case of the "*Ochindundu*," and other differing anatomical details very possibly exist. The "*Ochindundu*" is, like *R. personatus*, black in colour, but the first two pairs of legs are of a bright red hue. I have recently captured a similar insect which is entirely red. I present a rough sketch (fig. 2) of the "*Ochindundu*," made when the bug was first discovered. Having, as I have said, sent the original specimen to the British Museum, I cannot offer a better drawing.

Bionomics.

The "*Ochindundu*" preys upon ticks, catching them and sucking, by means of its powerful piercing proboscis, the blood with which they have filled themselves. The insect is provided with curious paddle-like structures on its first four legs, which are

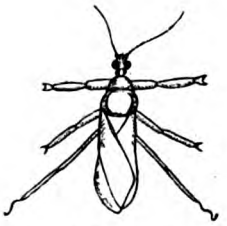


Fig. 2.—The "*Ochindundu*." Nat. size.

evidently designed for holding securely the tick upon which the creature feeds, the "*Ochindundu*" sitting, as it were, upon its hind pair of legs during the process. The attitude taken while sucking blood from a tick is shown in fig. 3. The only tick which I have actually seen in the clutches of the insect is *Ornithodoros moubata*, Murray. The substance of my note sent with the specimen forwarded to the British Museum is as follows:—

"I found this insect June 22nd, 1905, while studying the tick sent to the Museum some time ago (*O. moubata*, Murray). The bug was running about on the sticks composing a pig-sty where I was collecting ticks. My attention was attracted by its singular appearance and movements. Suddenly it entered a large crack in a stick and remained for some seconds. I could not clearly see what it was doing, so I had the stick split open, whereupon I found the insect in the position figured in the following sketch, holding a tick with its first four legs, and sucking blood from it, for which purpose it had inserted its proboscis deeply into the tick. The animal was so intent on its prey, that I was able to carry it to a house without disturbing it and to observe its actions for some time, and also to exhibit it in the act of sucking blood from the tick. When placed in a killing bottle, it withdrew its proboscis from its prey, but still clutched it with its legs. I mounted it in this position, and the wound may be seen in the tick near the margin of its body."

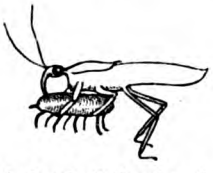


Fig. 3.—The "*Ochindundu*," showing the position it assumes in the act of sucking blood from a tick (*O. moubata*). Nat. size.

I have not determined its life-history. In some members of the *Reduviidæ* hexagonal masses of eggs are deposited in any convenient spot, numbering as many as seventy or even more, and the nymphæ differ markedly from the adults. Not having seen the metamorphosis of the "*Ochindundu*," I do not know if it be (like *R. personatus*) covered in its immature stages

with the viscid substance which causes particles of dust and small fibres to adhere not only to the body proper, but also to the legs and antennæ of the last-named insect, giving to it the weird appearance from whence has come its popular name of the Masked Bed-bug Hunter. The predaceous habits of the "*Ochindundu*" are to be expected, since other members of the family live on arthropods and even higher animals, including man. One species (*Prionidus cristatus*) feeds—both its nymphæ and imagines—upon all other insects it can capture, either in the larval or adult state, occasionally even overcoming and destroying its own kind. A powerful venom is injected into the victim when the strong proboscis is inserted, and it dies almost instantly. The bug then sucks the juices out of its prey and drops the empty skin (4).

Pathologic Importance.

The natives state that the "*Ochindundu*" regularly infests kraals and compounds for the sake of preying on ticks. This would seem to be reasonable, since many *Reduviidæ* are (as has been mentioned) predaceous, living on the ingested blood of hæmophagous arthropods, *e.g.*, *R. personatus* hunts the bed-bug (*Acanthia lectularia*). The "*Ochindundu*" thus may prove to be an unpaid assistant to the tropical sanitarian, helping him in the laudable task of combating the worst of all African vermin, which infests not only native lines, but is sometimes even found in white quarters. Another point which is worth mentioning is that the natives also state that the "*Ochindundu*" itself inflicts a bite which far exceeds in painfulness that of the tick upon which it feeds. I have seen several natives who claim to have been bitten by it. One of them was seen while he was still suffering from the effects of the bite. They compare its bite to that of a poisonous snake. These statements are borne out by what I can learn of the habits of other closely allied species. A variety of *R. personatus* is stated to cause intense pain by its bite, and it is said that when unskilfully handled it always bites. Its bite, like that of the "*Ochindundu*," is said to be almost equal to the bite of a snake, the swelling and irritation lasting for about a week. In some cases it has even proved fatal. Another species (*Conorhinus sanguisugus*), known in America as the Big Bed-bug, sucks human blood at first hand. Like the two insects just mentioned, *C. sanguisugus* inflicts a most painful wound, and its bite has been known to be followed by very serious results, the patient not recovering from the effects of it for nearly a year (5). It is very probable that "bites" attributed to scorpions, spiders, wasps, &c., are in some cases inflicted by the "*Ochindundu*" and its allies, of which latter I have collected three distinct species, which I hope to have determined as soon as opportunity offers. Three possible ways in which tropical *Reduviidæ* may attain pathologic importance occur to one:—

(1) By their destruction of disease-carrying creatures.

(2) By reason of their own venomous bites.

(3) Through their conceivable transmission of disease either directly by their own bites, or indirectly through other animals wounded and infected by them.

Supplementary Note on the "Ochindundu."

Just as I am posting the MS. of this paper I have received a letter from Mr. Austen, of the British Museum, who, writing under the date of November 3rd, 1905, assures me that my collections which I feared were lost have safely reached the Museum. It will now be possible to publish a determination of the bug above described by me, which I hope will appear in an early number of this Journal.

References.

(1) Wellman. "The Ochihopio Tick, &c.," *Rep. to Am. Soc. Trop. Med.*, 1905.

(2) *Id.* "On *Ornithodoros moubata*, &c.," *Ibid.*, 1905. *Id.* "An Insect which Preys upon Ticks" ("Notes from Angola," Note xv., Journal Tropical Medicine, 1905).

(3) Claus. "Lehrbuch der Zoologie."

(4) Comstock. "An Introduction to Entomology."

(5) *Ibid.*

HORSE-FLIES (TABANIDÆ) AND DISEASE.

By Ernest E. Austen.

Zoological Department, British Museum (Natural History).

If we except the Simulidæ, which consist but of a single genus, numbering, so far as our present knowledge goes, considerably less than one hundred species, and the Hippoboscidæ, the few species of which are permanent parasites of mammals and birds, the horse-flies, or Tabanidæ, are the only family of Diptera in which the blood-sucking habit is, with a few possible exceptions, universal in the female sex. For, even among the mosquitoes, which will doubtless at once suggest themselves to the mind of every one who reads the previous sentence, there are many species—and, as the family *Culicidæ* is at present constituted, even some genera—of which the diet is all that the most ardent vegetarian could desire. But horse-flies possess yet other claims to attention. Not only are the Tabanidæ among the largest of all families of Diptera, already including as they do the enormous total of nearly sixteen hundred described species, but the flies themselves are of relatively large size. Lastly, like mosquitoes, horse-flies are practically ubiquitous. Although they probably did not contribute to the "infinite torment of flies" that added to the horrors of "The Defence of Lucknow," there are few spots on the earth's surface where horse-flies are absent; and from Alaska to Tierra del Fuego, from Siberia to Ceylon, Cape Agulhas, and the South Island of New Zealand, they force their unwelcome attentions on men and animals alike. In many parts of Africa they are especially abundant. The swarms of "serut-flies" (under which name are included several species of *Tabanus*) encountered on parts of the Upper Nile have made life burdensome to many a traveller, from the days of Sir Samuel Baker to the present time; and the many new species of *Hæmatopota* recently received from Angola and Uganda seem to show that the African continent must be regarded as the head-quarters of that bloodthirsty genus.

In view, therefore, of the interest now being excited by blood-sucking Diptera as actual or potential disseminators of pathogenic organisms, it may be

worth while to devote a few moments to a consideration of the evidence tending to incriminate the Tabanidæ. Truth to tell, horse-flies, though often regarded with suspicion, have not yet been conclusively proved to be the *regular* conveyers of any form of disease among domestic animals or man in any part of the world. It is important to distinguish between the "regular" conveyer of a disease-causing organism and a mere accidental carrier. In the case of malaria, sleeping sickness, tsetse-fly disease, and, almost certainly, yellow fever, each malady is conveyed by certain blood-sucking Diptera, and *in no other way*. But when the bacilli of a disease such as anthrax are carried on the mouth-parts of a blood-sucking fly, the insect is merely a fortuitous agent. That a Tabanid or other biting fly which has sucked the blood of an animal suffering from anthrax may convey the disease to a human being, or to another domestic animal, is quite possible. The author is informed by Lieutenant-Colonel C. T. Bingham (late I.S.C.), that in Burmah mahouts believe that anthrax, which is prevalent among elephants, is carried by Tabanidæ, and on one occasion Colonel Bingham observed Tabanidæ among a number of flies on an elephant which had died from anthrax. The evidence for and against the conveyance of anthrax by flies has been well summarised by Nuttall,[1] who, however, as the result of his researches, is "struck by the very few positive cases recorded of anthrax arising from the bites of flies."[2] Nuttall considers that it is probable that infection by this means is "the exception and not the rule."[3] In India, Rogers has succeeded experimentally in transmitting *surra* (a disease of horses, cattle, and camels, caused by the parasite *Trypanosoma evansi*, Steel, and closely akin to the African *nagana*, or tsetse-fly disease) by means of the bites of horse-flies, but the insects were used merely as inoculating needles, and transmission was direct.

In the South of France (littoral of Var à Cavalière), Louis Léger has recently met with a new flagellate parasite (described by him under the name *Herpetomonas subulata*) allied to *Trypanosoma*, in the alimentary canal of *Tabanus* (*T. glaucopis*, Mg., ♀) and *Hæmatopota*.[4] The writer in question states that the parasite is not common, and that he has met with it only four times in sixty specimens of the genera mentioned, collected in autumn on horses and cattle. It should be noted that species of *Herpetomonas* are parasitic not only in blood-sucking flies, but also in non-biting forms, such as *Musca*, *Sarcophaga*, *Pollenia*, and *Fucellia*; but, apart from the settling of flies on abraded surfaces or wounds, it is, of course, only blood-sucking forms that are capable of infecting vertebrates, should the parasites be found to pass part of their life-cycle in a warm-blooded animal.

In the French Sudan, according to Laveran,[5] who quotes L. Cazalbou,[6] the disease of dromedaries at Timbuctoo, known as *mbori*, and that termed *soumaya* or *souma*, at Ségou, which affects horses and humped cattle coming from Macina, both of which diseases are trypanosomiases, are propagated by *Tabanus ditæniatus*, Macq., and *T. biguttatus*, Wied., *var.* Professor Raphaël Blanchard has recently[7] given reasons for suspecting *Tabanus nemoralis*, Mg., and *T. nigritus*, Fabr., two South European species which are met with in North Africa, to be the disseminators of a trypanosomiasis which affects dromedaries in Algeria. Within the last few months it has been stated by Pécaud,[8] in a paper on a trypanosomiasis of the Middle Niger (which, he says, is undoubtedly the same malady as that of Cazalbou at Ségon, referred to above, and attacks horses, mules, donkeys, and cattle), that "the animals especially attacked are those living in the vicinity of the Niger or its affluents (*marigots*). There are no *Glossina* [tsetse-flies] in this region, and consequently Tabanidæ must be charged with propagating the disease." A bare statement such as this that tsetse-flies are absent from a district in which they might well be supposed to occur, falls very far short of scientific proof that the malady is disseminated by horse-flies. More than once in recent years have species of tsetse been shown to be abundant in localities in which they had previously been declared non-existent; and even should there be no tsetse on the Middle Niger, some other biting fly, such as *Stomoxys* or *Simulium*, may abound there. Still, it may be admitted that there is at least a case for enquiry. The part played by tsetse-flies in the dissemination of sleeping sickness, as well as nagana (tsetse-fly disease of animals), shows us that if horse-flies are capable of conveying organisms that are pathogenic to domestic animals, they may quite conceivably perform a similar *rôle* as regards human beings, and it is hoped that this little paper may have the effect of directing the attention of readers of this Journal to the question of "Tabanidæ and Disease."

[1] G. H. F. Nuttall, M.D., Ph.D. "On the *Rôle* of Insects, Arachnids, and Myriapods, as Carriers in the Spread of Bacterial and Parasitic Diseases of Man and Animals. A Critical and Historical Study," *Johns Hopkins Hospital Reports*, vol. viii. (1899), pp. 1-155, Plates I.-III.

[2] *Op. cit.*, p. 2. [3] *Op. cit.*, p. 11.

[4] Louis Léger. "Sur un nouveau Flagellé parasite des Tabanides," *Comptes Rendus Hebdomadaires des Séances de la Société de Biologie*, T. lvii., No. 37 (December 30th, 1904), pp. 613-615; figs. in text.

[5] *Comptes Rendus des Séances de l'Académie des Sciences*, T. cxxxix. (séance du Octobre 31, 1904), p. 661.

[6] *Recueil de Médecine Vétérinaire*, October 15th, 1904.

[7] *Archives de Parasitologie*, T. viii., No. 4 (1904), pp. 578-579.

[8] *Comptes Rendus Hebdomadaires des Séances de la Société de Biologie*, T. lx. (January 19th, 1906), p. 59.

THE ANATOMY OF THE BITING FLIES OF THE GENUS *STOMOXYS* AND *GLOSSINA*.

By Lieut.-Colonel G. M. Giles, I.M.S. (Retired.)

In the fifteenth report of the Liverpool School of Tropical Medicine, p. 14, published last year, the writer made some note of a trypanosomiasis of horses existing in Kumassi which appeared to be conveyed by a species of *Stomoxys*. Bodies which he regarded as an evolutionary stage of the parasite were found in the fluid taken from the stomach of a fresh insect dissected on the spot, but, unfortunately, the visit was

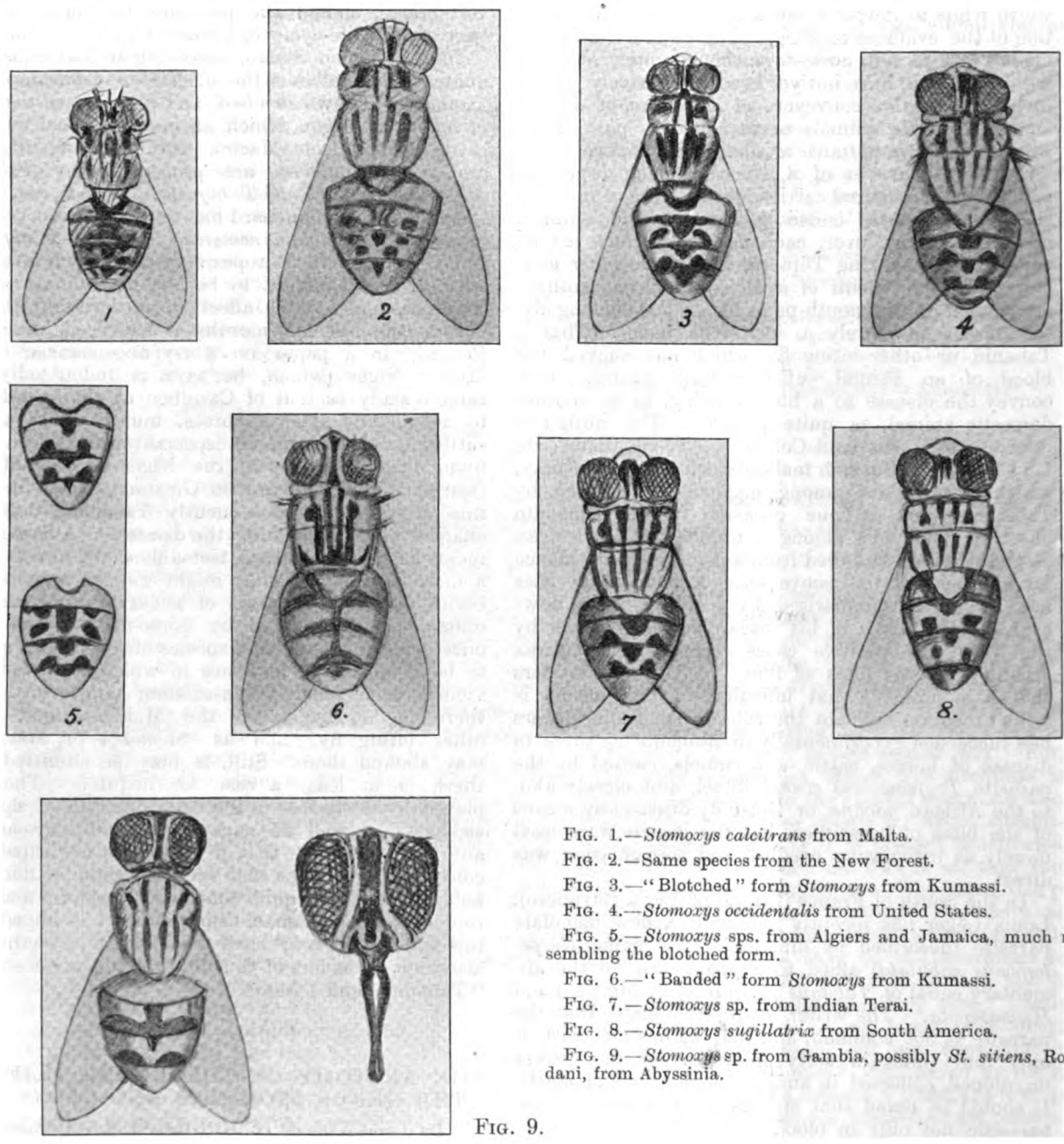


FIG. 1.—*Stomoxys calcitrans* from Malta.

FIG. 2.—Same species from the New Forest.

FIG. 3.—"Blotched" form *Stomoxys* from Kumassi.

FIG. 4.—*Stomoxys occidentalis* from United States.

FIG. 5.—*Stomoxys* sps. from Algiers and Jamaica, much resembling the blotched form.

FIG. 6.—"Banded" form *Stomoxys* from Kumassi.

FIG. 7.—*Stomoxys* sp. from Indian Terai.

FIG. 8.—*Stomoxys sugillatrix* from South America.

FIG. 9.—*Stomoxys* sp. from Gambia, possibly *St. sitiens*, Rondani, from Abyssinia.

FIG. 9.

so hurried, the object of our visit to the "Coast" being mainly to examine into the actualities and possibilities of anti-malarial sanitation, that little more could be done than to carefully prepare a number of the flies for subsequent microscopical examination.

The examination of this material has since been undertaken, but though bodies have been met with which it seemed might be referable to protozoal parasites, Prof. Minchin, to whom they have been submitted, does not consider that they represent stages of a trypanosome.

At an early stage of the work it became evident that some comparison with flies known to be free from disease of the sort was imperative, and it was necessary to turn aside and examine English specimens of the same genus which are, fortunately, fairly easily obtainable; and some comparison with the flies of the genus *Glossina* was clearly desirable. This piece of work took up much time, and as has been seen, remains the only solid result for the labour involved.

Meanwhile a report by Prof. Minchin on the anatomy of the tsetse-fly has appeared in the *Proceedings of the Royal Society*, V. B. 76, 1905, p. 531, and a similar paper on that of *Stomoxys*, by Lieut. F. Tulloch, R.A.M.C., is in the press. The present communication, therefore, is devoted mainly to such points as are not covered in these communications, which will be quoted whenever possible, though some repeti-

tion may be unavoidable. My thanks are greatly due to Prof. Minchin for giving me advance proofs of Lieut. Tulloch's valuable paper. It may be noted that the word "stomach" in Prof. Minchin's paper should, he wishes to state, read proventriculus. As a matter of fact, it is very difficult to avoid ambiguity in the use of terms such as "stomach," Strictly speaking, the diptera have no "stomach" in the sense of a localised dilatation of the upper part of the mid-gut.

In the mosquitoes, what is called the "stomach" is the entire mid-gut, with the exception of the narrow anterior part contained in the thorax and forepart of the abdomen. In the Muscidæ, including the species under consideration, there is no stomach in the sense of a localised dilatation, but the anterior part of the mid-gut forms a long tube of sausage form, and has distinguishable characteristics from the parts behind. Lowne, in his classical work on the blow-fly, calls this the "chyle stomach," and the continuation of the tube as far as the point of entry of the Malpighian tubes the "proximal intestine," while, between this and the commencement of the rectal valve is a short piece of intestine which he speaks of as the "metenteron," distal intestine, or hind gut. What Professor Minchin speaks of as the "sucking stomach" Lowne usually calls the crop, and as it is difficult to ascribe any aspiratory function to this organ the former term is to be preferred, although it is placed in the abdomen, and not in the neck, like the crop of a bird.

These explanations are necessary, as frequent references to Professor Minchin's account of the anatomy of *Glossina* are necessary to avoid needless repetition of work already performed, but Lowne's terminology will be adopted in the account that follows.

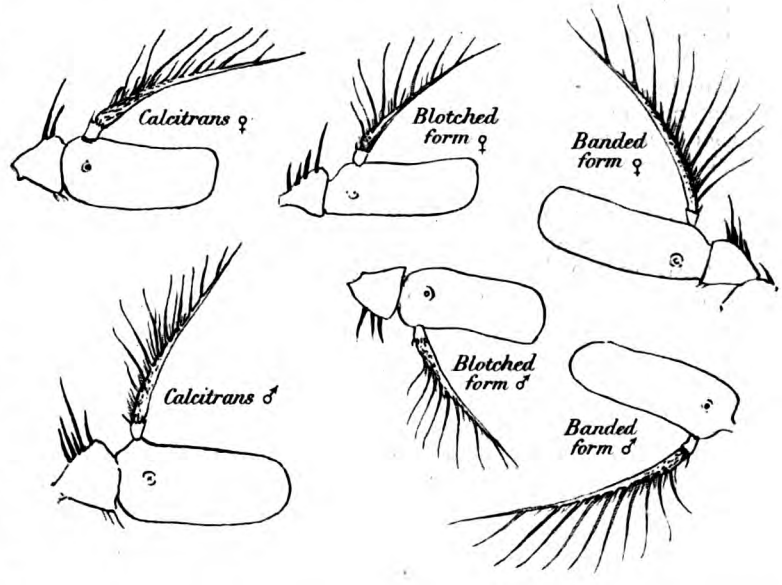
The genus *Stomoxys* includes a small group of biting flies, which resemble each other so closely that their distinction is an extremely difficult matter. It appears to be truly cosmopolitan, species or races being reported from all parts of the world. The type species may be taken as *Stomoxys calcitrans*, which is common in all parts of England, especially where horses are allowed to run wild, as in the New Forest, where it is locally known as the "forest horse-fly," and the pony owners have an erroneous idea that it is peculiar to the neighbourhood. It has been found also in Malta, North Africa, and Jamaica, and flies from the Indian Terai closely resemble it, as also does *St. enos* from New Zealand, and *St. vernon* from British Columbia. *St. occidentalis* from the United States, and *St. suggillatrix* from South America, are also closely similar.

Curiously enough the flies brought by me from Kumassi, and collected together from a swarm that was tormenting the animals in the horse lines there, included two fairly distinguishable forms.

As Mr. Austen, of the British Museum, is shortly undertaking an examination of this genus, and careful drawings are being prepared for the purpose, it was decided not to attempt to name these forms, but to speak of them for the present as the "blotched," and "banded" forms respectively. The former closely resembles *C. calcitrans*, while the latter is much like some specimens in the Museum derived from the island of Mauritius.

The accompanying rough figures give some idea of the markings of these various forms and of the closeness of their resemblance to each other, but does not pretend to close accuracy or proportional size, as any attempt to do so is clearly superfluous in view of the fact that the task is at present in the skilful hands of Signor Terzi.

I am inclined to think, however, that a means of distinction is to be found in the flagellum of the antenna or arista, as it is usually called by dipterologists. This structure is provided with a discrete fringe of long hairs, and I find that the number of these varies in the different forms, as well as sometimes in the sexes of the same species. Besides the long hairs, there are a number of shorter ones which may be spoken of as accessory hairs, and in *Stomoxys calcitrans* these are much longer than in either the "blotched" or "banded" forms.



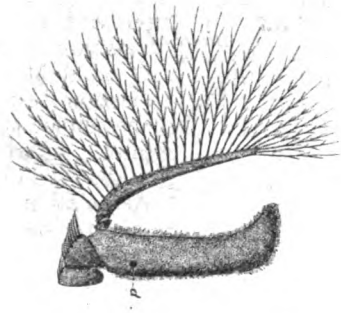
The above figures will illustrate my meaning better than much description.

The long main hairs spring more from the dorsal side of the arista, as it is usually carried by the insect, and so project almost directly upwards, while the accessory hairs are arranged along its inner side, and project inwards and upwards. In specimens mounted in balsam both ranks are forced more or less into the same plane, and are so represented in the figures. Besides the two principal ranks the proximal half or more of the arista is closely clothed with hairs, which in some cases are as long as those I have termed the accessory hairs, but neither these nor the extremely close dress of fine hairs that cover the antenna proper are represented in the camera

lucida drawings. The principal hairs are, it will be noted, simple.

A glance at the drawings shows that the three forms can be quite easily distinguished, and moreover, that the "banded" Kumassi *Stomoxys* resembles the English *St. calcitrans* more than the "blotched" form, which resembles the latter more closely in colouration. Both sexes in the "banded" insect have ten principal hairs, whereas in the blotched one there are but eight in each sex, and the entire arista is shorter proportionally to the last joint of the antenna. In both sexes on each of these forms the accessory hairs are quite short. *Stomoxys calcitrans* has seven principal hairs in the ♀ and nine in the ♂, and may be further distinguished from the banded form by the comparative smallness of the fork formed between the termination of the arista and the most distal principal hair. The accessory hairs are also very much longer than in either of the other forms, especially in the male, a further peculiarity of which is that the next but longest principal hair is provided with a small branch about half-way in its length. As far as observed these characters appear to be constant, but the series examined is not numerous enough to speak with certainty on this point. The remaining forms mentioned have not been examined, as they were British Museum specimens, and it is hardly possible to produce an accurate drawing for comparison without mutilating the specimen so as to be able to mount the antenna in balsam.

The antenna of *Glossina*, a drawing of which is reproduced from Mr. Austen's monograph, as will be seen, differs entirely in having compound principal hairs. Among the flies recently sent to the Museum is a *Stomoxys* from the Gambia, easily distinguishable by the brilliant white marking of the frons, and which answers fairly to the description of *St. sitiens* from Abyssinia.

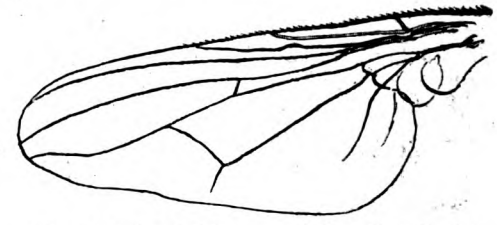


Rondani's description is, however, too brief to admit of certain identification without comparison with his types. Besides this there is a form from Somaliland which much resembles my "banded form," in marking, and as far as can be made out in the armature of the arista, but is easily distinguished by the pinkish colour of the lighter markings on the frons. On the whole, however, it seems improbable that more than half-a-dozen forms will require to be distinguished.

The genus *Stomoxys* was founded in 1762 by Geoffroy "L'Hist. abregeé des Insectes," ii., p. 538), with the following definition: "*Antennæ patellatæ seta laterali pilosa, os rostro sululato simplici acuto, ocelli tres.*" He notes further its close superficial resemblance to the common fly, but remarks that "its more widely separated wings and its shorter abdomen give it a look that make it easily recognisable to close observation. In France it is commonest in autumn, and he points out that this probably is the origin of the old French saying, "les mouches d'automne pignoient." His figure is unmistakable.

A more modern definition is to be found in Schiner's "Fauna Austriaca," i., p. 577, but is no better suited to the requirements of modern classification, as it is so planned as to include *Hæmatobia*, which differs from *Stomoxys* in the easily recognisable character of having the palpi nearly as long as the proboscis, whereas in *Stomoxys* they are of quite insignificant dimensions.

The venation of the wing presents nothing very characteristic, and is so closely similar in the various forms that it is unlikely to be of much service for the distinction of species. Moreover, owing to the wing being far from flat it is difficult to so mount specimens as to obtain strictly comparable outlines for comparison.



Stomoxys, banded form, ♂. Venation of wing.

Just as in the case of the common house-fly, the tropical forms on *Stomoxys* are considerably smaller than the English insect. The two sexes resemble each other so closely that it is difficult without close examination to distinguish them from each other, especially as both males and females are equally bloodthirsty, and a gorged male often distends its abdomen to such an extent as to look much like a gravid female. The most prominent point of difference is that the space between the eyes is much wider in the females. Examined casually the abdomen differs but little in the two sexes, but a closer examination reveals the point that while that of the female ends in a papilla-like ovipositor, the hypopygium of the male is tucked under him in much the same way as that of the female crab. On closer examination the male genital apparatus proves to be of a very complicated character, and this, too, may prove of service in classification.

(*To be continued.*)

HYPNOTIC SUSCEPTIBILITY OF THE NEGRO RACE.

By C. W. Branch, M.B., C.M.Edin.
St. Vincent, B.W.I.

There being, as I believe, but little so far recorded of therapeutic hypnotism in negroes, the included figures may be of interest to those practising in

THOMAS EDMONSTON CHARLES, M.D., LL.D.Edin., F.R.C.P.Lond.

tropical climates, who will take the trouble to verify the utility of hypnotism.

I do not propose to give any results of therapeutic suggestion, but merely to indicate the psychological fact of the degree of susceptibility of the black race to hypnotism.

For the purpose of obtaining a percentage, notes were kept of a 100 consecutive persons of pure negro blood who were tried under various conditions favourable or otherwise to hypnotism. Of these it was found that 87 were influenced at the first sitting. Of the 13 who failed, two whom it was desirable to hypnotise were influenced at the second try. The other 11 were not tried again. Of these last one was a case of mania, one a child of feeble intelligence, and two very aged doting persons. All these four were not subjects who could be expected to be influenced.

The method employed was almost invariably simple persuasion to sleep, aided usually by stroking of the forehead, or, in a few cases, by fixation of the eyes by the finger or other object.

In two cases of mania fascination was resorted to, and failed with one. Passes were tried without success on the two cases of mania and on the imbecile child. In some instances persuasion addressed to several persons at once and indirect persuasion (of another person) have been used. The latter was unsuccessful on one occasion only, and that was with one of the dotards.

Unintentional hypnotism has occurred more than once, though none of those so influenced are included among the 100 cases.

Compared with the results among whites in Europe, where 80 to 84 per cent. are found susceptible after many tries, these figures show that the negro is distinctly more susceptible. It might be inferred that a more expert hypnotist would find the negroes susceptible to the extent of nearly 100 per cent.

So easily influenced do I find my black and coloured patients that at hypnotic cliniques all the patients in the room were hypnotised simultaneously. Those who had previously attended fell asleep at the bare command, while new cases, by imitation and persuasion, were asleep in a minute or less. In this way ten persons have been operated upon at once, and there is probably no limit except that of accommodation.

It is probable, that given the attitude of expectancy, such as that of persons desiring medical treatment, a Liebault or Bernheim could hypnotise to sleep as many blacks as could hear and understand him, as readily as an expert prestidigitator hypnotises his entire audience into visual illusions and sometimes hallucinations.

The ages and sexes of the 100 cases referred to are shown in the table below:—

Age	Hypnotised M.	Hypnotised F.	Not Influenced M.	Not Influenced F.
3 to 14 years	7	7	0	1
14 „ 21 „	5	5	0	1
21 „ 60 „	14	31	1	5
Over 60 „	7	11	4	1
	33	54	5	8

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THE

Journal of Tropical Medicine

APRIL 2, 1906.

A TROPICAL MEDICAL ASSOCIATION.

HAS the time arrived when it is possible to found an association of medical men interested not only in Tropical Medicine, but in the position Tropical Medicine as a definite branch of General Medicine should take and aspire to? The question has been brought keenly home to me by the difficulty encountered on several occasions of obtaining permission to hold a Section of Tropical Diseases at the annual meetings of the British Medical Association. The Section of Tropical Diseases has on several occasions been omitted by the authorities to whom the allocations of sections at the annual meetings of the Association have been entrusted, and it was only by representation and persuasion that a tardy acquiescence to hold the sectional meeting was obtained.

This year, again, at the meeting at Toronto, a Section of Tropical Diseases is omitted; and although the writer has represented the matter both to Canadian authorities and to the Council of the parent Association, nothing has come of it.

The reply on several occasions has been that Tropical Diseases might be considered under the auspices of or as a sub-section of the "Medicine" Section. Any one acquainted with the impossibility of dealing with all the papers sent to the Section of Tropical Diseases at the annual meetings, is aware that to include

Tropical Diseases in any other section or sections is calculated to prevent men interested in Tropical Diseases attending the meetings. Not only is it that there is no time for the papers to be read, but when a subject appertaining to tropical diseases is brought forward, the medical man who reads the paper or opens the discussion wishes to have the matter laid before experts, and before those interested directly in the disease or investigation he has undertaken. The Section of Tropical Diseases in connection with the annual meetings of the British Medical Association has been a pronounced success. The numbers attending the Section, even remembering the scattered constituency from which it is gathered, have frequently been larger than any other section of the annual meeting; and the importance and scientific value of the communications may surely, without prejudice or exaggeration, be stated to be of superlative importance.

From yet another point of view are the practitioners in the Tropics deserving of full recognition at the annual meetings. The number of medical men directly interested in Tropical Medicine amounts to some 6,000, and they form the largest section of qualified medical practitioners on the British Register whose interest is centred in any single subject. Of the 34,000 men on the register, some are interested in general medicine, some in surgery, others in gynæcology, obstetrics, skin, eye, throat, ear, nose, epidemiology, anatomy, physiology, pathology, nervous diseases, ambulance work, dentistry, or other sections provided at the annual meeting; but no single section can show so large a body of men on the British Register to whom one single section presents so singular an adhesion as that of Tropical Diseases.

The writer is led to believe that in expressing the above opinions, he is merely voicing those of most of the members of the large body of British practitioners interested in Tropical Medicine, for the need of some metropolitan rallying point for our numerous but scattered body is sufficiently obvious. Assuming such a society to be formed, it would of course be well to seek affiliation with the British Medical Association, as such a step would enable the association to make their voices heard in the councils of the parent society.

The writer desires, before proceeding further in the matter, to have the opinion of medical men to whom this question is one of importance. Many subjects of supreme consequence to the State and to the individual would be dealt with by such an association, and in time it ought to become one of the most important of the several departments of medicine, both scientifically and ethically.

The readers of this Journal who wish their names to appear on the General Committee of "A Tropical Medical Association," should send in their names, addressed to the writer at the office of this Journal, 89, Great Titchfield Street, Oxford Street, London, W. It is to be distinctly understood that the contemplated association is not a separate association, independent of the British Medical Association, but one intended to promote the interests of Tropical Medicine within the parent Association, and constituted so that the wishes of medical practitioners in the Tropics may be authoritatively and collectively expressed.

JAMES CANTLIE.

ANTI-MALARIAL SANITATION IN INDIA.

THE short "Editorial" which we reproduce below from the columns of the Indian *Pioneer* is a gratifying proof of progress in the education of public opinion in India on the subject of the possibilities of anti-malarial sanitation.

The facts, indeed, as therein quoted from Major Duke's report, are of a kind to convert the most sceptical, and we congratulate our influential lay contemporary on its altered attitude with respect to the question; for it is not so long ago that the *Pioneer* and the army of "common-sense" correspondents whose letters found a favourite home in its columns, found it hard to sufficiently express their contempt for those who believed it possible to sufficiently diminish the number of mosquitoes to effect a corresponding diminution in the sick list of malaria. The measures adopted by Major Duke, it will be noted, are in no way novel, but are simply those that have been recommended from the first by Major Ross and those who have associated themselves with him in the campaign. Now that the *Pioneer* has been converted, we may perhaps hope that the Indian Government may follow suit, and that perhaps in ten or twelve years or so we may hear of its undertaking general adequate measures for the protection of our troops in cantonments and of the civil population of our great Indian towns.

"The report of the Medical Officer in Baluchistan for the year 1904, though late in issue, contains at least one fact that is worth recording. In Baluchistan, malaria is 'at once the greatest primary cause of illness, and indirectly gives rise to a large proportion of the ill-health expressed in other terms.' To show what can be done by preventive measures Major Duke quotes the records of the Shahrig Railway Hospital, which is largely attended by the civil population of the tahsil and bazaar and villages near. The average annual number of malarial cases treated between 1898 and 1900 was 2,827, and in 1900 there were 3,227 cases. The following year the number rose to 3,376 cases, and in 1902 special anti-malarial measures were enforced. Quinine was distributed, surface drainage and the kerosining of pools were adopted, and the malarial cases fell to 2,722. In 1903 these measures were continued, and in addition, the cultivation of rice within a mile of the tahsil was prohibited, and in that year the cases fell to 1,792. In 1904, with the continuance of these measures, there was a further fall to 957 cases. At the same time, in the dispensaries above and below Shahrig, in the last-named year, there was in the one case a steady and in the other a great increase in malarial cases. Thus 1904 was evidently not a healthy year in the district, and there is no evidence of any exodus of population. The effectiveness of the anti-malarial campaign is thus clearly established."

Translation.

PRELIMINARY STATEMENT ON THE RESULTS OF A VOYAGE OF INVESTIGATION TO EAST AFRICA.

By R. KOCH.

(*Translated from the German by P. Falcke.*)

(*Continued from page* 76.)

(4) TSETSE-FLIES AND TRYPANOSOMA.

I HAVE met with four different species of the genus *Glossina* during my expeditions. These are *Glossina fusca*, *G. morsitans*, *G. pallidipes* and *G. tachinoides*.

In addition, *G. palpalis* has been found in the islands of Victoria Nyanza belonging to German territory by Dr. Feldmann, and probably also *G. longipennis*, which I caught during my journey by the Uganda Railway between Voi and Tsavo Stations, not far from the German frontier. Thus six out of the eight species of *Glossina* hitherto described occur in the German East Africa.

It has hitherto been taken for granted that *G. morsitans* is the carrier of tsetse disease. This species, however, is only found in certain tracts of the Protectorate, particularly in the north and south, between the great lakes; in the middle, its place is filled by *G. pallidipes*.

G. tachinoides, the smallest of the *Glossina*, appears to be widely distributed, but only appears in small numbers. On the other hand, I have encountered *G. fusca* in great numbers wherever tsetse disease is prevalent.

I was first successful in discovering specimens of *G. fusca* infected with trypanosomata, and in the following manner. On examining the flies under the microscope I noticed that the proboscis was always filled with a liquid which, by pressure on the bulb of the proboscis, could be squeezed out in the form of a clear droplet. As it might be presumed that the fly, in puncturing, injects this droplet under the skin of its victim, and that infected flies must have trypanosomes in this liquid, I examined the drops exuded from a number of specimens microscopically, and actually found numbers of trypanosomes in a few cases. The circumstance that the liquid was quite devoid of red blood cells, that the trypanosomes were much more numerous than they ever are in the blood, and that they exhibited various stages of development, led one at once to the conclusion that these flies do not transmit the disease direct by injecting the blood of a sick animal into a healthy one; but that conditions here are similar to those that exist in malaria parasites, *i.e.*, that the trypanosomata undergo a stage of development in *Glossina*. The correctness of this assumption was fully verified when the flies, whose probosci contained trypanosomes, were more minutely examined. Sections of the stomach, even when quite devoid of blood, contained large numbers of trypanosomes in different stages of development. They are either entirely absent from the intestine, or are only present in very small numbers. I have never been able to definitely establish the presence of trypanosomes in either the glandular organs, the Malpighian tubes or elsewhere than in the situations mentioned.

In all nearly sixty flies containing trypanosomes were examined, including one specimen each of *G. morsitans* and *G. pallidipes*.

It appears to me, therefore, a foregone conclusion that in German East Africa the tsetse disease is transmitted not only by *G. morsitans*, but also by *G. pallidipes*, and particularly by *G. fusca*, which quite coincides with my observations on the distribution of these species.

As far as I have made out, the cycle of development of the trypanosome in the *Glossina* is as follows: The trypanosomes ingested with the blood, the number of which, under natural conditions, is very limited, soon multiply in the stomach by longitudinal division, and also increase in size. The degree of growth will be best seen by a comparison between fig. 15, which represents a trypanosome from the blood of an ox, and fig. 16, which shows a trypanosome from the stomach of an infected *Glossina*. Simultaneously a remarkable differentiation sets in.

Part of the large trypanosomes become thick and plump, with a rich blue-staining plasma, and exhibit a rather large, rounded chromatin body of loose consistency (fig. 16). Other portions of the parasites are exceedingly slender, and their plasma does not take the blue stain, but possess a long, thin, dense chromatin body (fig. 17). Sometimes one type predominates, sometimes the other, and in different parts of the same preparation close aggregations of each form may be met with.

(*To be continued.*)

Abstract.

THE PREVENTIVE TREATMENT OF DISEASES (Les Médications Préventives). By Dr. L. Nattan-Larrier. 1 vol. in 16. Baillière et Fils, Paris.

The history of preventive medicine commences with inoculation for small-pox and vaccination, but in 1880 the work of Pasteur and of Toussaint opened up a new field of research by demonstrating that the inoculation of a modified microbic culture might confer a specific immunity on animals. The principle of preventive bacterio-therapeutics has been definitely established since 1881. In 1885 Ferran published the good results which he had obtained by treating cases of Asiatic cholera by means of a vaccine derived from cultures of the comma bacillus; and although his statements were at first treated with much scepticism, they would appear to have been since confirmed by Haffkine's researches. The remarkable discoveries of Behring and Kitasato in 1890 of the antitoxic sera resulted in the serotherapeusis and seroprophylaxis of diphtheria and of tetanus. Since then the question has advanced with giant strides, and (as will be shown in this book) it is now possible by means of injections of serum or of modified cultures to arrest the development of diphtheria, plague, cholera, enteric fever, tetanus, and possibly also puerperal fever. Immunisation by serum is a *passive immunity*, whilst immunisation by modified cultures is an *active immunity*.

[For want of space I shall limit my remarks to those on Plague, Cholera, Enteric Fever, and Yellow Fever, as they apply more especially to warm climates. —J. E. N.]

PLAGUE.

Two specific methods have been proposed and employed to combat plague: one of these we owe to Yersin, namely, immunisation by anti-plague serum; the other, due to Haffkine, consists in the inoculation of cultures killed by heat. We will now consider each of these two methods.

I. *Preventive Serotherapeusis of Plague.* — The earliest researches of Yersin, Borrel, and Calmette

demonstrated the immunising power of the anti-plague serum. In January, 1897, Roux was able to state in the *Académie de Médicine*: "Hitherto the serum has only been tried in the case of confirmed disease. According to what has been observed in animals, it ought to be still more efficacious in the prevention of plague than in its cure. It would therefore appear necessary, when a case of plague has suddenly appeared in a house, for all persons who are exposed to contagion to be injected with serum as a preventive measure. Yersin thinks this is an efficacious measure against the diffusion of the disease." Cases of preventive serotherapeusis soon became numerous, the dose of the serum usually amounting to 10 cc., which, however, appeared to confer immunity for only fourteen days. It is therefore necessary to renew the preventive injection every twelve days in the case of individuals who remain in the epidemic focus; this necessity is the more imperative, as, although the morbidity is lessened, the mortality remains as high in the case of individuals whose immunity is exhausted as it is amongst those who never underwent any preventive injection. In consequence of the short duration of the immunity conferred by the serum, and of the need for the revaccination to be repeated several times a month, Simond and Yersin were of opinion that "sero-vaccination was not applicable in practice for an entire population, although an excellent method to be adopted in individual cases or in families."

II. *Inoculations by Sterilised Cultures.*—Haffkine's method seems on the whole to answer best for an extensive prophylaxis of plague, as it can be applied to a whole population; it has been largely used in India with the sanction of Government. The *rationale* consists in cultivating the *Bacillus pestis* in bouillon, under a layer of butter for a month, and then enclosing the culture in tubes, which are now sealed and heated for an hour at 72° C.; the culture enclosed in these tubes is then ready for inoculation purposes. The duration of the immunity conferred by injection varies from four to six months, and, in any, case, does not extend to the year, although Haffkine has noted some cases where it would appear to have been prolonged even up to two years; however, the general opinion in India is that immunity may be considered as exhausted at the end of three months, and therefore those individuals who reside in plague-stricken regions renew their inoculation every three months.

The French opinion, held by Calmette, Salimbeni, and Yersin, is that immunisation only commences by slow degrees, after a period in which vaccination favours the action of the plague bacillus. The British opinion is notably different, for it maintains that the period which elapses before the acquisition of immunity does not exceed twenty-four hours. The injection is somewhat painful, and although followed by general lassitude, frontal headache, a marked rise of temperature, &c., for a period varying from twelve to forty-eight hours, is not accompanied by serious results. The febrile reaction is the greatest objection raised against inoculation, and seriously militates against the wholesale vaccination of the population with Haffkine's plague-prophylactic fluid. The dose should not be less than 5 cc., and the operation is usually repeated in two or three weeks' time.

Conclusions arrived at.—Both methods of preventive treatment are efficacious.

The serotherapeusis, although more rapid and more certain in its action, only confers a transitory immunity, and therefore can only protect the individual from contagion by repeated inoculations, which is a difficult matter when one has to deal with the whole of the population; on the other hand, it is an excellent method for individual prophylaxis, such as in the case of the medical *personnel*, the employees of the sanitary services, or the families of the patients. Sero-vaccination, when combined with isolation and disinfection, holds high rank among the methods of defence against plague.

Major M. B. Bannerman ended his report in 1902 on the application of Haffkine's method with the following remarks: "The inoculation is absolutely innocuous: inoculations made during the period of incubation of plague in many cases exercise an abortive action on the disease. Inoculation confers immunity to a high degree; and if, in spite of the inoculation, an individual is attacked by plague, his chances of recovery are much greater."

Haffkine's method probably still requires to be perfected, but it already answers to a great extent to the desiderata of a preventive treatment applicable to a large number of individuals when an entire country is threatened with an invasion of an epidemic of plague.

Cholera.

In 1885 Ferran announced his method of vaccination against cholera, which reduced the mortality by exactly one-half. Since 1894 Haffkine's method has given even more remarkable results, although no official pressure was used, and only those individuals were vaccinated who freely consented to undergo this treatment. Haffkine's method consists of a double inoculation with an interval of five to eight days; the *first* injection at first consisted of cultures of the comma bacillus sterilised by the addition of carbolic acid, but this method has been replaced by the use of living cultures attenuated by heating up to 72° C.; the *second* injection is a culture of high and constant virulence obtained by a continuous series of "passages" of the bacillus through the peritoneum of guinea-pigs, the comma bacillus thus acquiring a virulence which is twenty times stronger than before. Immunity is exhausted after one year.

The symptoms of anti-choleraic vaccination consist in a localised œdema at the seat of injection, which is painful to the touch, accompanied a short rise of temperature, but no serious accident has ever been caused thereby. Wherever cholera has been sufficiently scattered and prevalent so as to lead one to suppose that the whole of the population has been equally exposed to infection, and wherever the mortality has been high, in every instance this mortality has been greatly reduced in the case of the inoculated. A preventive anti-choleraic serum has also been tried, but it has hitherto proved less useful than the vaccine in those regions in which cholera is endemic, but the question is not yet definitely settled.

Enteric Fever.

I. *Serotherapy.*—Although the anti-typhoid serum of Professor Chantemesse possesses undeniable pre-

ventive properties, it has rarely been employed prophylactically, so we cannot yet ascertain to what extent preventive serotherapy will enter into practice.

II. *Wright's Vaccine.*—The vaccine employed by Wright to obtain immunity against typhoid fever is somewhat allied to Haffkine's vaccines; both consist of cultures sterilised by heat, but whilst the microbes are inoculated by Haffkine, Wright decants his cultures and only injects their toxins. The process of the preparation of the vaccine may be summed up thus: Culture of Eberth's bacillus for a fortnight in the drying-stove at 37° C., sterilisation at 65°, addition of one-half per cent. of lysol. The filtered liquid is used for inoculation; its degree of virulence is such that the inoculation of 5 cc. entails in twenty-four hours the death of a guinea-pig weighing 250 grammes.

The dose varies from $\frac{1}{2}$ to $\frac{3}{4}$ cc., this latter being the dose most suitable when an interval of several weeks must elapse between inoculation and exposure to infection, and when one cannot resort to inoculations in succession. On the other hand, when inoculation is practised in the very midst of the epidemic a weaker dose must be employed, and after an interval of one week a second injection must be given, but in a stronger dose. The inoculation may be given in the hypochondrium, or any other part where there is an abundance of loose connective tissue. The injection of a medium dose does not usually give rise to any well-marked symptoms, and the patient ought to return to duty in three days. When too strong a dose has been injected the general symptoms become more severe, but without causing immediate danger.

Immunity is produced more or less rapidly, according to the dose of vaccine employed; when a very feeble one has been given, immunisation may be produced in about twenty-five hours; for this reason, in epidemic centres a feeble dose should first be given, and this should be followed by a second one. The duration of immunity conferred by Wright's vaccine does not exceed one year, and may begin to decrease after six months.

Conclusions.—Wright's method, without entailing any danger for the inoculated individuals, seems to give very favourable results, viz., considerable diminution in the number of cases, and relative mildness of the enteric fever which may develop, in spite of the injection. The inoculation may be dangerous if the person is inoculated with too strong a dose whilst he is in the fever zone when the epidemic is at its height, as he is then more likely to contract the disease. Wright's vaccine is especially indicated in the case of troops employed in Colonial expeditions.

Yellow Fever.

The researches of Marchoux, Salimbeni and Simond, if still far from solving the question of preventive serotherapy and in yellow fever, nevertheless bring some important contributions to this question, as they have carefully ascertained the period during which the patient's serum contains the organism of the disease, and have sought to discover to what degree the blood of yellow fever patients might contain immunising substances. These researches on the preventive serotherapeusis of yellow fever were undertaken (*a*) by means of virulent blood, sterilised in various ways; (*b*) by means of serum from convalescents, this serum no longer containing the agent of yellow fever, but being endowed with immunising properties.

(*a*) On the third day of the disease the blood of the yellow fever patient contains the pathogenic agent, an invisible microbe, capable of provoking yellow fever; the inoculation of $\frac{1}{10}$ cc. of serum is sufficient at this period to give yellow fever; but if heated up to 55° C., this serum becomes harmless, but still preserves its immunising properties.

(*b*) After the fourth day the blood of the patient is incapable of transmitting the disease; it was therefore thought that this sudden disappearance was accompanied by the presence of immunising bodies in the serum. The injection of serum from a convalescent patient may indeed confer immunity on a healthy subject; but this serum only retains this property during a period of twenty-six days, after which it can only confer partial immunity. However, these admirable results cannot as yet be considered as entirely confirmed, and their prophylactic measures, although of the highest importance, must still be considered as in the experimental stage only. J. E. Nicholson.

EXTRACTS FROM COLONEL GORGAS' MONTHLY REPORTS FROM THE CANAL ZONE, PANAMA.

By Isaac Brewer, M.D.

Trypanosoma in Rats on the Isthmus of Panama.

During the month of November, 1905, Dr. Arthur I. Kendall, Acting Chief of the Board of Health Laboratory of the Canal Zone, examined 1,563 rats, and found 278 infected with *Trypanosoma lewisi*.

During the same period he examined 547 mice, in 39 of which he found trypanosomes.

Malarial Parasites.

According to the monthly reports issued by Colonel Wm. C. Gorgas, Chief Sanitary Officer of the Isthmian Canal Commission, 1,942 blood examinations were made from September 1st to December 31st, 1905.

Malarial parasites were observed as follows:—

Single tertian	772
Double tertian	17
Æstivo-autumnal	764
Quartan	4
Mixed infections	78

Parasites in Fæces.

The following results of 394 examinations of stools made by the Sanitary Department of the Isthmian Canal Commission during September, October, and December, 1905, are tabulated from the monthly reports issued by Colonel Wm. C. Gorgas, Chief Sanitary Officer of the Canal Zone:—

Ova of *Uncinaria duodenale*	101
Ova of *Tricocephalus dispar*	104
Ova of *Ascaris lumbricoides*	58
Amœba dysenteriæ	30
Rhabdonema strongyloides	21
Cercomonas intestinalis...	19
Balantidium coli...	2
Myiasis	2
Trichina spiralis	1
Bacillus dysenteriæ	9
Negative	116

In 2,512 analyses of urine during the same period hæmoglobinuria was observed 13 times.

Review.

BLOOD-SUCKING FLIES AND HOW TO COLLECT THEM. By E. E. Austen.

The British Museum have issued a second edition of this valuable pamphlet, which should be in the hands of every tropical practitioner.

Although in the main a reprint, a description of the *Leptidæ* has been added, as this family occasionally exhibits bloodthirsty habits. We should have liked, however, a figure of one of the alleged blood-sucking species, so as to know them when we see them.

Other notes, for example, on the Implication of Stomoxys in the transmission of Surra, have been added, which show how careful Mr. Austen is to keep the pamphlet up to date.

A further addition is a note by Lieut.-Col. Giles on the preservation of insects intended for histological examination.

The pamphlet is published at the nominal price of 3d., and Mr. Terzi's beautifully drawn and accurate figures are alone worth a great deal more than the small outlay; and the additions, though not extensive, are sufficient to make the acquisition of the new edition desirable.

We were somewhat surprised, therefore, when a copy of the old edition was tendered us on demanding one at the Catalogue counter of the Museum. We trust this was due to delay in furnishing the salesman, and not to a desire to "work off" the old stock. Such a petty economy would be much to be deprecated, as it might, for example, easily result in the museum losing specimens of the *Leptidæ* owing to the attention of collectors not being drawn to them.

Correspondence.

To the Editor of the JOURNAL OF TROPICAL MEDICINE.

DEAR SIR,—In a recent copy of the Journal Dr. Wellman referred, in his "Notes from Angola," to the treatment of so-called "malarial ulcers" by local applications of quinine.

May one enquire how the application is made? Is it the emulsion in cod liver oil that is used (see *Lancet* of 1902), or is there some fresh method of application?

Yours, &c.,
W. D. G.

Drugs and Remedies.

CYPROL—a distillation of Cypress oil—is commended as an excellent remedy in Whooping Cough. F. A. Rogers, 327, Oxford Street, London, supplies the pure concentrated oil—Cyprol, as well as an essence, a liniment, and pastilles prepared from the oil.

GASTRODYNIC—a compound enzyme palatinoid—a combination of Pancreatin Pepsin and Lactophosphate of Lime, prepared by Messrs. Oppenheimer, Son and Co., Limited, London, seems an effective remedy in dyspepsia. The ingredients are in equal quantities of one grain in each palatinoid, and one to three palatinoids may be given after meals in cases of ordinary dyspepsia.

XAXA—an acetyl-salicylic acid, issued by Messrs. Burroughs Wellcome and Co. in five-grain tabloids—appears to possess the therapeutic properties of salicylic acid and its salts without unpleasant after-effects.

For the relief of pain fifteen grains of "Xaxa" may be given at a single dose, with ten-grain doses repeated in one hour until three or four doses have been given.

Books and Papers Received.

WE have received "The Doctor's Handy Reference List" from Messrs. Pulman and Sons, 24-26, Thayer Street, Manchester Square, London. This is a useful compendium, and affords exact information concerning asylums, sanatoria, convalescent homes, nursing homes, &c.

Notes and News.

PLAGUE has broken out in Seistan, in Eastern Persia, the frontier province of that country towards India. The nature of the disease has been confirmed by bacteriological information, but it is said that the disease is not spreading. Captain Kelly, I.M.S., has been specially sent from Quetta to render assistance.

A splendid example of the warm affection that grows up between the people of India and their European medical officers is afforded by the munificent donation of 10,000 rupees (£670) which has been received by the Central Committee of the Countess of Dufferin's Fund from Brig.-Surg. J. Law, Indian Medical Service (retired). The interest on this sum, in accordance with the donor's desire, will be annually expended in the Central Provinces where he spent the greater portion of his service. Retired Indian medical officers are seldom too well off, especially if they have passed most of their time in the Central Provinces, which is one of the least prosperous parts of our Indian Empire. In point of fact, the proceeds of the private practice of the men stationed there are much on a par with Mr. Bob Sawyer's, which readers of "Pickwick" may remember might be "put into a wineglass and covered over with a gooseberry leaf." Viewed in comparison with the colossal donations to charity of financial magnates, the sum may not appear large to European eyes, but it probably represents far greater personal sacrifice. With such warm feelings existing between doctors and their Indian patients it is hardly wonderful that the native chiefs and wealthy civilians should view with strong resentment the petty-minded restrictions on private practice inflicted on the Service by the late Viceroy, Lord Curzon. As an old Sikh Sirdar remarked the other day anent this question: "It is very hard that a man should not be allowed to do what he likes with his own." There is no more libellous assertion than that the Indian is lacking in the virtue of gratitude, for their folk-lore and epic literature conclusively show that a generous recognition of benefits received is regarded by them as the first requisite of the heroic character.

"Unification."

A correspondent of the *British Medical Journal* of March 17th (S. G.) makes a number of thoroughly practical suggestions on the organisation of our Imperial medical services. While regarding "Scalpel's" remarks on "Surgery in the R.A.M.C.," in the same journal for December 25th, as quite uncalled for, there can be no disputiug the assertion that efficiency, whether in surgery or hygiene, is largely a matter of practice, and that during peace time the work of the military surgeon is rather that of sanitary specialist than of an operative surgeon. Hence, could it be arranged, the plan of combining our military and colonial medical services, as advocated by "S. G.," could hardly fail to promote efficiency in each service, and would probably be popular with the best officers of both.

S. G. writes as follows:—

"Surgery in the R.A.M.C.

"I have read 'Scalpel's' remarks on surgery in the R.A.M.C. in the *British Medical Journal* of December 23rd, 1905, p. 1682. There is no doubt that lack of opportunity is the great bar to efficiency in surgery among men of the R.A.M.C. As a remedy I would propose a dual medical service, one for India and one for home and the Colonies. I think the present dual service for India a mistake. I would do away with the R.A.M.C. there and make the I.M.S., increased in strength, responsible for the care of the army, British and native. The smaller civil surgeries and dispensaries I would hand over to assistant surgeons and hospital assistants. Here we would have a magnificent reserve for this class, sufficiently strong in numbers and thoroughly trained in professional work. In like manner I would make college appointments and the care of the large civil surgeries, the charges of gaols, &c., prizes for the officers. Here, again, we would have a magnificent reserve, capable of taking the field, fresh from the charge of hospital where as much surgery is done as in most of the large London hospitals. At present a young officer of the R.A.M.C. comes to India where everything is new to him. Tropical diseases present phases and symptoms which are strange and unknown to him. During his first year he is beginning to get a grasp of his new duties. During his second and third years he is perfecting himself in the knowledge of tropical surroundings and diseases, and by the time he has grasped them and thoroughly understands them back he goes to England, where, perforce, he forgets many of the valuable lessons acquired during his Indian tour. The question of attendance on the men of the various regiments, batteries, &c., to be transferred to the Home Establishment could be easily arranged for by handing these duties over to medical officers of this new service going on leave. This would also be an immense boon to them and save them the terrible expense of passages for themselves and families, which so often makes such inroads on their slender resources. The Home Medical Service I would run on much the same lines as the Indian, making the Colonial Medical Service its reserve and the colonies its training ground."

Although nominally civilians, many colonial surgeons, especially in the African colonies, see far more fighting than usually falls to the lot of an officer of the R.A.M.C., and it is unjust that they should be debarred from the honours and glories incidental to a military career. Moreover, the special sanitary training of the R.A.M.C. would be as valuable to the officer when acting as a colonial civil surgeon, as the increased experience in ordinary medical and surgical practice would be to him when serving in a military capacity. Most important of all, it is difficult to see how in any other economical fashion a sufficient military medical reserve can be secured for our Colonies.

His remarks on India are equally to the point. Owing to linguistic difficulties, it is indispensable that all branches of public service of that dependency should join for continuous service, and the medical departments are the only branch in which this is not enforced. The officers of the Royal Engineers serving there, for example, "elect for continuous service in India," and it is only in the medical department that we find the extraordinary spectacle of two distinct sets of medical officers, one only of which is capable of serving with all corps of the army, while the other is quite unavailable for service with the native regiments that form three-fourths of our Indian army.

The "Sanitas" Company, Limited.

At the Annual General Meeting (28th in number) of the "Sanitas" Company, Limited, held at Locksley Street, Limehouse, London, E., on March 1st, Mr. C. T. Kingzett, F.I.C., F.C.S., presiding, the Chairman remarked upon the steady growth of "Sanitas" in public favour, and while it was still regarded, from an all-round point of view, as the standard disinfectant (being the only preparation which combined in itself all the properties that could be desired for sick-room and household applications), it was necessary for the Company to meet competition from all sides. Hence, as the result of long investigation in their laboratories, the Company was about to introduce a new disinfectant to be known as "Bactox," which would favourably compare with the strongest known bactericides hitherto available, having a guaranteed co-efficiency of from thirteen to forty, as compared with pure carbolic acid. It was described as a neutral non-corrosive, saponaceous preparation, and having regard to its great germicidal strength and price would be found cheaper in use and as strong as, or stronger, than any competing article on the market, and devoid of all objectionable qualities. They would, therefore, in future, be able to offer to the public and sanitary authorities the choice of the best disinfectant for household and sick-room purposes on the one hand, and the strongest germicide for rough disinfecting and surgical use on the other hand.

Personal Notes.

R.A.M.C.

The following R.A.M.C. officers have been selected for increased pay: Lieutenant-Colonels Townsend from July 22nd, Woodhouse from August 26th, and Rowney from October 4th, 1905.

Colonel Leake, R.A.M.C., embarked in the *Sicilia*, on February 3rd, returning to India from sick leave.

Lieutenant Webb, R.A.M.C., remains at home on extended leave until August next.

Lieutenant-Colonel Reade, R.A.M.C., comes out on posting to the Secunderabad Division.

Lieutenant-Colonel J. B. Winter, R.A.M.C., on his arrival from England, will be attached to the Meerut Station Hospital for duty.

Colonel Trevor, R.A.M.C., is appointed Hon. Surgeon to the Viceroy, *vice* Colonel W. S. Pratt vacated.

Indian Medical Service.

Major L. Rogers, I.M.S., Officiating Professor of Pathology, Medical College, Calcutta, is allowed privilege leave for twenty-seven days, with effect from February 19th or subsequent date.

Captain J. M. D. Megaw, I.M.S., Officiating Resident Physician, Medical College Hospital, Calcutta, is appointed to act as Professor of Pathology in the Medical College, during the absence, on leave, of Major L. Rogers, I.M.S.

Captain H. B. Steen, I.M.S., Officiating Civil Surgeon, is placed on special duty at the Medical College, with effect from January 10th.

Captain C. F. Weinman, I.M.S., Officiating Civil Surgeon, is placed on special duty in connection with plague in Belear, from December 25th, 1905.

Captain H. M. Melhuish, I.M.S., whose services have been placed at the disposal of this Administration, is appointed to officiate as Superintendent, Central Jail, Jubbulpur, during the absence on leave of Captain F. D. Browne, I.M.S.

Captain V. E. H. Lindesay, I.M.S., is allowed privilege leave combined with leave out of India for thirteen months and twenty days, viz., privilege leave for one month and twenty days, and leave out of India on medical certificate for the remaining period, with effect from November 10th, 1905.

Major F. O'Rinealy, I.M.S., Officiating Civil Surgeon of Darjeeling, is confirmed in the appointment with effect from September 23rd, 1905, *vice* Major F. P. Maynard, I.M.S.

Captain R. L. Hagger, I.M.S., furlough for eight months.

Major A. E. Roberts, I.M.S., is confirmed as Secretary to the Director-General, I.M.S.

To be Major: Captain Herbert St. John Fraser.

Lieutenants to be Captains: William Samuel Jagoe Shaw, Charles Seymour Parker, Harold Holkar Broome, Frederick Norman White, Charles Gibbons Seymour, Davis Heron, Thomas Corrie Rutherfoord, Henry Crewe Keates, Leethem Reynolds, Ernest Charles Taylor, Richard Arthur Needham, Dwarko Prasad Goil, James Kirkwood, and Alfred Whitmore.

Home Department.—Colonel Macrae, I.M.S., is confirmed as Inspector-General, Civil Hospitals, Bengal, and Colonel King, I.M.S., as Inspector-General, Civil Hospitals, and Sanitary Commissioner, Burmah, both with effect from April 29th.

Major Lamont, I.M.S., Professor, Lahore Medical College, is granted furlough out of India from March 20th to June 30th next. Captain G. E. Charles, I.M.S., officiates as Professor of Anatomy, Lahore Medical College, *vice* Major Lamont.

Captain W. M. Houston, I.M.S., to act as Personal Assistant to the Surgeon-General with the Government of Bombay. Captain J. H. McDonald, I.M.S., on relief, to act as Presidency Surgeon, Second District, and Marine Surgeon and Superintendent, Lunatic Asylum, Colaba. Dr. F. M. Gibson, Medical Officer, attached to the Plague Research Laboratory, Parel, is granted three months' privilege leave combined with twenty-one months' furlough from the date of relief.

Privilege leave for two months and twenty-one days, in combination with furlough for eight months and nine days, is granted to Captain F. D. Brown, I.M.S., Superintendent, Central Jail, Jubbulpur, with effect from the afternoon of February 14th.

India Office: Arrivals Reported in London.—Captain J. W. F. Rait, I.M.S., B. Major C. E. L. Gilbert, I.M.S. Major C. R. M. Green, I.M.S., B. Lieutenant-Colonel R. J. Baker, I.M.S. Captain F. D. Brown, I.M.S. Captain R. L. Hagger, I.M.S. Major R. H. Castor, I.M.S.

Extensions of Leave.—Captain D. C. Kemp. I.M.S., M., special and study leave commuted to furlough on Med. Cert. for one year. Captain H. B. Meakin, 6 m. Med. Cert., R.A.M.C. Major H. Austen-Smith, I.M.S., B., was on study leave from October 9th, 1905, to February 9th, 1906. Captain E. L. Perry, I.M.S., B., was on study leave from September 1st, 1905, to December 31st, 1905, 4 m., M.C. Lieutenant-Colonel J. Maitland, I.M.S. M., 6 m., M.C., the period beyond 3 m. and 17 days being extraordinary leave.

Uncovenanted Medical Department.

Mr. S. Higginbottom to be Superintendent of the Government Leper Asylum at Naini in the Allahabad District.

Colonial Medical Service.

Lehfeldt.—R. H. Lehfeldt, D.Sc.Lond., B.A.Camb., Professor of Physics in the Transvaal Technical Institute, Johannesberg.

Gibbs.—H. J. Gibbs, L.R.C.P., M.R.C.S., M.P.C., Resident Surgeon to the Tan Toch Sing's Hospital, Singapore.

Singer.—C. Singer. M.B., B.C.Camb., Resident Medical Officer to the Government General Hospital, Penang.

DOMESTIC.

Births.

Graves—At Kamptee, C.P., on February 24th, 1906, the wife of Major D. H. Graves, I.M.S., of a son.

Marriages.

A marriage has been arranged between Captain Cecil Maddock, Indian Medical Service, 43rd Erinpura Regiment, son of the late Canon Maddock, M.A., Fellow of Clare College, Cambridge, and Alice Edome, daughter of the late Rev. T. J. Monson, M.A., and the Hon. Mrs. Monson, of Ashlyn, Leighton Buzzard.

A wedding took place at Dehra Dunn on February 5th between Captain George Hutcheson, Indian Medical Service, eldest son of Colonel Hutcheson, Indian Medical Service, retired, and Miss Lilian Annette Reynolds, youngest daughter of Mr. and Mrs. Reynolds, of Chandbagh, Dehra Dun.

Clarke—Adams.—At St. George's Church, Agra, on February 15th, 1906, by the Rev. W. Kitching, M.A., Chaplain of Agra, Captain J. B. Clarke, Royal Army Medical Corps, to Violet Grace Seymour Adams, M.B., C.M.(Edin.).

Burke—Reid.—At Christ Church, Rawal Pindi, on Wednesday, February 21st, 1906, by the Rev. H. A. C. Herbert, Captain Bernard Bruce Burke, R.A.M.C., to Anne, younger daughter of Surgeon-General A. Scott Reid, C.B., I.M.S., Principal Medical Officer, Northern Command.

Cameron—Robinson.—At the Cathedral, Bombay, on Friday, February 16th, 1906, Alexander Cameron, M.B.(Lon.), Indian Medical Service, second son of Alexander Cameron, M.D., of Cleethorpes, Lincolnshire, to Charlotte Eccles Mostyn, third daughter of the late Arthur Robinson, Esq., of Kemp Town, Brighton, and of Mrs. Robinson, Olton, Warwickshire. (Indian papers, please copy.)

Southon—Young.—At St. Thomas's Cathedral, Bombay, on February 16th, 1906, by the Rev. Harold Foote, Captain Charles E. Southon, I.M.S., 57th Rifles, F.F. Peshawar, to Agnes McLeod, younger daughter of John H. S. Young, Esq., Edinburgh.

List of Indian Medical Officers in Military Employ on Furlough.

Showing the Name, Regiment, or Department, and the Period for which the Leave was granted.

Armstrong, Lieutenant-Colonel H., I.M.S., 8 m., September 30th, 1905.
Babington, Lieutenant J. W. H., I.M.S., 9 m., fr. September 27th, 1905.
Browne, Lieutenant H. H., I.M.S., 1 y., fr. March 17th, 1905.
Clarkson, Major F. C., I.M.S.
Donovan, Major C., I.M.S.
Eyre, Lieutenant-Colonel, M.S., I.M.S., 1 y., fr. September 23rd, 1905.
Fayrer, Captain J. D. S., I.M.S.
Fooks, Major H., I.M.S., 18 m., fr. March 28th, 1905.
Fry, Captain A. B., I.MS., 1 y., fr. October 26th, 1905.
Gilbert, Major C. E. L., I.M.S.
Hamilton, Captain W. G., I.M.S., 1 yr., fr. October 5th, 1905,
Hirsch, Lieutenant L., I.M.S., 15 m., fr. March 21st, 1905.
Hodgson, Lieutenant E. C., I.M.S.
James, Captain S. P., I.M.S,
Kirkpatrick, Captain H., I.M.S.
Lapsley, Captain W., I.M.S., 22 m. 1 d., fr. September 25th, 1905.
Lindesay, Captain V. E. H., I.M.S.
Lister, Captain A. E. J., I.M.S., 16 m., fr. February 12th, 1905.
Lumsden, Major J. S. S., I.M.S.
MacKelvie, Captain M., I.M.S.
Maddock, Captain E. C. G., I.M.S.
Mason, Captain W. G., I.S.M.D.
Meakin, Captain H. B., I.M.S., 18 m., fr. March 23rd, 1905.
Miller, Captain A., I.M.S.
Orr, Major W. H., I.M.S.
Parker, Lieutenant C. S., I.M.S., 1 y., fr. August 28th, 1905.
Perry, Captain E. L., I.M.S., 33rd Punjaub.
Pinchard, Captain M. B., I.M.S., 1 y., fr. August 12th, 1905.
Rait, Captain J. W. F., I.M.S.
Rodgers, Lieutenant-Colonel J. W., I.M.S., 52nd Sikhs.
Rundall, Lieutenant L., I.M.S., 24 m., fr. September 17th, 1904.

Russell, Major A. R. P., I.M.S.
Shore, Lieutenant-Colonel R., I.M.S.
Steel, Lieutenant R. F., I.M.S.
Stephen, Captain L. P., I.M.S., 1 y., fr. June 24th, 1905.
Swaine, Lieutenant-Colonel C.L., I.M.S.
Sweeney, Lieutenant-Colonel T. H., I.M.S.
Tate, Captain G., I.M.S., 1 yr., fr. October 3rd, 1905.
Waddell, Lieutenant-Colonel L. A., C.B., C.I.E., I.M.S., 24 m., fr. October 21st, 1904.
Willcocks, Captain R. D., I.M.S., 13 m., fr. May 27th, 1905.

PLAGUE.

Prevalence of the Disease.

		Cases.	Deaths.
India.—Week ended	Feb. 17th	8,926	7,362
,,	,, 24th	9,420	8,312
,,	March 3rd	10,580	8,770
S. Africa.—Week ended	Feb. 17th	0	0
,,	,, 24th	0	0
Hong Kong.—Week ended	Mar. 3rd	8	7
,,	,, 10th	15	16
,,	,, 17th	7	7
,,	,, 24th	15	15
Mauritius.—Feb. 11th to	Mar. 17th	0	0
Week ended ,,	24th	2	0
Japan (*Formosa*).—Jan. 1st to	31st	48	38
Brazil (*Pernambuco*).—			
January 24th to 31st	...	1	0
Peru.—January 21st to 31st	...	21	10

OBITUARY NOTICE.

Thomas Edmonston Charles, M.D., LL.D.Edin., F.R.C.P.Lond., Honorary Physician to the King; Surgeon-General, I.M.S.

It is with sincere regret, which will be shared as a personal sorrow by many of our readers, that we have to record the death of Dr. T. Edmonston Charles, at Flushing, near Falmouth, at the none too ripe age of seventy-two

Dr. Charles was the son of a clergyman of the Established Church of Scotland, and was born in Calcutta in 1834, but in accordance with the usual custom, was at an early age sent home for education.

Electing the medical profession as his future career, he entered the University of Edinburgh, and graduated as M.D. and L.R.C.S. in 1855. His early connection with India naturally led to his deciding to follow his father's footsteps to the "land of regrets," and accordingly in the following year he joined the medical service of the Hon. East India Company.

The young medical recruit's admission to the service came just before the most exciting period of Anglo-Indian history, and before he had been a year in the service he found himself in the thick of the desperate struggle for existence that occupied the years 1857 to 1859.

His old friend and brother officer, Sir Joseph Fayrer, who contributes to the *British Medical Journal* a long and sympathetic notice, gives the following abstract of his services:—

"Soon after arrival he was attached to the 1st Bengal Fusiliers, served with them during the campaign of 1857-8, and took part in the celebrated march from Dugshai to Umballa. He was in medical charge of 400 men of that regiment and two squadrons of H.M. 9th Lancers, forming the advanced brigade of the army; was present with the regiment at the battle of Badlee ka Sarai on June 8th, 1857, and throughout the entire siege of Delhi till its final capture on September 20th. He accompanied the column under Brigadier J. G. Gerrard, C.B., into the Rewaree District against the Jeypore and Jodhpore rebels, and was with Sir Thomas Seaton, K.C.B., during his operations in the Doab; was present at the action of Gungeyree, the battles of Ruttialee and the affair at Mynpoorie. He was with the army on its second advance on Lucknow under Lord Clyde, and was with the storming party of the 1st Bengal Fusiliers, who took the enemy's first position at the Chuker Kotee and other points in their line of defence. He was present throughout the rest of the siege of Lucknow, and subsequently with the column under Sir Hope Grant, K.C.B., in Oude. He was mentioned in the despatch of Major Hume of September, 1859, and received the Indian medal, and clasps for Delhi and Lucknow. He was appointed Garrison Assistant Surgeon, Allahabad, 1859, Officiating Garrison Surgeon in 1859, and First Assistant to the General Hospital, 1860. Soon after this Charles returned to Calcutta and joined the General Hospital, where he held an important post. On the retirement of Dr. Wilson, of the Medical College of Bengal, from the post of Professor of Midwifery and Obstetric Physician, Charles was appointed in his place. He continued to perform the duties of this office for many years with great success and with much benefit to the cause of medical education in India. Not only as an obstetric but as a general physician Dr. Charles met with great success, and obtained a large practice in the Presidency. The trying and responsible duties of this work in an Indian climate in time produced their natural results, and rendered it necessary for him to resign, in 1880, an appointment which had been to him the source of much professional repute and its consequent advantages."

One of his last services to India was the foundation of the Eden Hospital, Calcutta, which has since become one of the most important gynæcological institutions of the empire.

Retirement to Dr. Charles, however, by no means implied a cessation of work, which, indeed, in a man of less indomitable energy would probably have resulted in downright illness, but was simply a transfer of his labours to more favourable climatic conditions. He settled first at Cannes and afterwards at Rome, and was busily engaged in practice in each of these favourite resorts. With all this he found time to show himself a learned archæologist and an enthusiastic mountain climber. After twenty-two years' more work in these fields of activity, finding, as most men must at an earlier age, that a man of sixty-eight can scarce expect to be able to work as hard as younger men, he decided to retire to the mild climate of Falmouth, were he remained until the end of an exceptionally strenuous life. In Flushing, close by the old Cornish town, he found a charming resting place, an old Georgian villa, with a sunny garden running down to the beautiful estuary of the Penryn river,

where his trim 3-tonner lay moored. Here the veteran might often be seen amongst his roses or busied in demonstrating the marvellous mildness of the climate by cultivating tropical plants in the open. With such surroundings it was characteristic that he should become a keen yachtsman, and winter or summer, blow high, blow low, scarce a day passed without his passing several hours afloat. Besides this he showed active interest in the local medical and scientific institutions, and but a few days before his death was asked to permit himself to be elected as President of the South-western Branch of the British Medical Association. His contributions to medical literature were numerous and valuable, notably his revision of the Sydenham Society's translation of Marchiafava, and Bignami's work on malaria.

To such of us of a younger generation who enjoyed the pleasure of his personal friendship, nothing could be more stimulating than the example and conversation of one who, in spite of failing physical strength, showed himself to the last conversant with the latest developments of tropical medicine. Like most truly lovable men, Dr. Charles could be a sturdy fighter when he chose, especially when his strong sense of right and justice was aroused in the interests of others, and perhaps his last contribution to medical literature was his able statement of the facts of the unfortunate dispute as to priority between Prof. Grassi and Major Ronald Ross. So conclusive was his handling of the question that it practically secured the verdict of scientific Europe in Ross' favour, and the controversy practically died a natural death from the date of its issue.

Dr. Charles had been failing in physical strength for some time, but the end came rather suddenly. During the last few months he had had several short attacks of fever, possibly recrudescences of malaria, and these left him very anæmic. Still, when his old comrade, Sir Joseph Fayrer, visited him he could find no signs of organic disease, and there is no doubt that Dr. Charles' pathetic diagnosis of his own case was quite correct: "I am quite well, only the machinery is worn out." It is consolatory to know that his last days were marked by but little suffering, and that his end was such as must be desired by all men of science: to retain intellectual activity to the last, and to pass away simply because the physical organism had not rusted but worn out.

Through the kindness of Mrs. Charles we are enabled to present our readers with a striking portrait of this veteran tropical physician, who was, we know, the personal friend of so many of our readers.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Annales de l'Institut Pasteur," 1905, p. 715.

Schneider, L. E., and Buffard, M., after examination of affected animals on both continents, state that the trypanosomiasis of horses and donkeys in Algeria is identical with the "dourine" met with in various countries of Europe.

"Zeitschr. f. Hyg.," T. li., 1905.

YELLOW FEVER IN BRAZIL.

Otto, M., and Neumann, R. O. There is comparatively little new in this memoir, which contains the usual descriptions of Stegomyia, &c., with some excellent plates. They succeeded in carrying some of these mosquitoes to Hamburg, and breeding them in a hothouse through a certain number of generations. They find that eggs kept dry on filtering paper lose their vitality comparatively quickly if the temperature of the air is high, but survive some time if it be cooler. However, they do not think that there is any danger of their breeding on board ship even in the case of wooden vessels, as bilge water is too salt for the larvæ to live in. They also conducted some experiments to ascertain the possibility of infected mosquitoes being carried about in luggage, and come to the conclusion that there is little or no danger of such an occurrence. They did not succeed in discovering any new specific organism, and, like many others, quite failed in their attempts to cultivate the *Bacillus icteroides*, nor did they have any better fortune in experimenting with the 4 μ bacillus of Durham and Myers.

"Journal American Medical Association," February 3, 1906.

TREATMENT OF CHOLERA.

Ussher, C. D., acting upon Koch's suggestion that quinine should be tried in the treatment of cholera, has met with marked success in the outbreak of cholera in the Philippines; as many as 90 per cent. of the patients recovering. The plan of treatment was as follows: Sulphate of quinine ten grains every hour until the rice-water stools disappeared, and bile is passed in the motions. For suppression of urine, friction of the limbs, hot fomentations, dry cupping over the loins, and sweet spirits of nitre are useful. When evidences of the circulation failing supervened, subcutaneous saline injections prove beneficial. The sulpho-carbolates of zinc, lime, and soda in equal quantities, given at intervals of from two to four hours, are efficient when irritability of the bowel persists, with a foul odour of the evacuations.

"Revue Suisse de Zoologie," 1905, p. 415.

SOME TAPEWORMS OF THE CHIMPANZEE.

Bourquin, J. As the anthropoid apes have been found useful in experiments in connection with the investigation of sleeping sickness, the above reference may be of interest to those engaged in the investigation of that disease.

"Vierteljahrschrift der Naturforschenden Gesellschaft Zurich," 1905, p. 163.

MIGRATION OF TRICHINA EMBRYOS.

Stäubli, C., who is in agreement with the previous observations of Akanazy, traces the embryos from the gut into the lymph channels and so to the thoracic duct, whence they are carried into the blood-vessels, and so to the muscles, where they become encysted. Naturally, the most active muscles being most vascular, arrest a disproportionate share of the intruders.

Notices to Correspondents.

1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the JOURNAL OF TROPICAL MEDICINE should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communications.

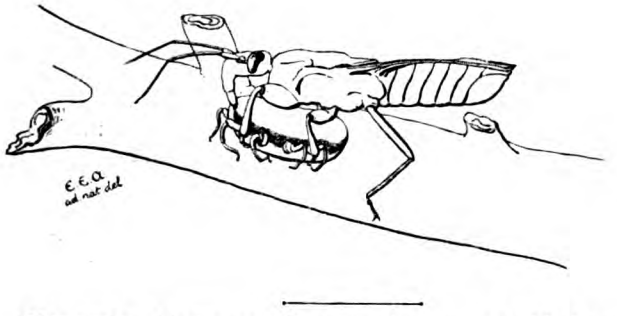
AN INSECT ENEMY OF THE DISSEMINATOR OF HUMAN TICK FEVER IN ANGOLA.

By Ernest E. Austen.

Zoological Department, British Museum (Natural History).

Among a consignment of blood-sucking and other insects received in August last from Benguella, Angola, and forwarded by Dr. F. Creighton Wellman, is a specimen concerning which the sender wrote as follows: "I found this insect on June 22nd, 1905, while studying a tick, *Ornithodoros moubata*, Murray, specimens of which I sent you some time ago. It was running about on the sticks composing a pig-sty, where I was collecting ticks. My attention was attracted by its singular appearance and movements; suddenly it entered a large crack in a stick, where it remained for some seconds. Since I could not clearly see what it was doing, I had the stick split open, when I found the insect holding a tick with its four anterior legs (which you will see are provided with curious paddle-like structures evidently designed for this purpose) and sucking blood from it by means of its powerful piercing proboscis, which it had inserted deeply into the tick. The animal was so intent upon its prey that I was able to carry it to a house without disturbing it, and to observe its actions for some time. I also exhibited it in the act of sucking blood from the tick to Mr. W. E. Fay, B.A., a former student at the London School of Tropical Medicine. When placed in a killing bottle the insect withdrew its proboscis from the tick, but still clutched it with its first two pairs of legs. I mounted it in this position, and you will notice the wound in the tick near the margin of its body."

The specimen referred to in the foregoing interesting note by Dr. Wellman is a hemipterous insect, or bug, belonging to the family *Reduviidæ*, and to the species known as *Phonergates bicoloripes*, Stål. It is still grasping its victim in the manner described above, but the tick has become shrivelled and distorted in consequence of drying. The subjoined sketch will, however, perhaps make the position of the destroyer and its prey, as well as the general appearance of the former, sufficiently clear.



Phonergates bicoloripes, Stål, preying on *Ornithodoros moubata*, Murray.

The following is a brief description of Dr. Wellman's specimen of *Phonergates bicoloripes*, a species which was originally described from "Caffraria," and of which the Museum collection includes three examples from the Zoutpansberg district of the Transvaal. *Length*, 18½ mm.; width of thorax at base of wings, 5¼ mm.; width of abdomen (on which, when insect is at rest or walking, the wings lie closed one over the other like the blades of a pair of scissors) 5 mm. *Colour:* thorax metallic purple; wings (which when closed conceal abdomen when insect is viewed from above) deep velvet-black; hind-legs bluish-black; front and middle femora and front tibiæ coral-red, with tips of femora, and base and tip of front tibiæ, black; middle tibiæ, brownish. The front and, to a lesser extent, the middle femora are swollen. The tips of the front and middle tibiæ are provided on the underside with a large spongy pad, which assists the insect in obtaining a firm grip of its prey.

The bugs of the family *Reduviidæ* prey, as a rule, upon insects of all kinds, and the writer is informed by Mr. W. L. Distant that he has even seen a specimen preying upon a weevil, *i.e.*, a beetle belonging to the family *Curculionidæ*, the intense hardness of the chitinous covering of which is well known. It is, of course, possible that by this time Dr. Wellman has met with other instances of *Phonergates bicoloripes* attacking *Ornithodoros moubata*, but it is extremely unlikely that the bug preys especially upon the tick in question. In all probability the specimen observed by Dr. Wellman happened to alight close to a tick, and seeing the latter crawling at once pounced upon it.

SUGGESTIONS FOR THE MAINTENANCE OF HEALTH BY WOMEN IN THE MISSION FIELD.[1]

By Mary A. D. Scharlieb, M.D.Lond., B.S.

The subject can be considered under the following heads:—

(1) *Preparation for Work in the Mission Field.*
(*a*) A good rest and general "getting fit."
(*b*) Examination and care of teeth, eyes, skin.
(*c*) Medical examination and advice.
Special examination of intending wives.
(2) *Selection of Candidates.*
Reasons for declining offers—age, disease, defects, deformities, nerves, bad family history.
(3) *Allocation of Candidates to Special Work.*
(4) *Care of Health on Active Duty.*
(*a*) Clothes, food, drink, purification of water.
(*b*) Choice and construction of houses; selection of site.
(*c*) Amount of work, exercise, and rest.
(*d*) Care of minor ailments—chills, slight fever, diarrhœa, toothache.
(*e*) Dangers of mosquitoes, flies and ticks.
(*f*) Annual holiday.
(*g*) Daily dose of quinine.
(5) *Care of Health when on Furlough.*
(*a*) Medical examination and advice on arrival.
(*b*) Choice of locality for holiday.

[1] Paper read at the Medical Officers of Missionary Societies Meeting, March 20, 1906.

(*c*) No deputation work on short furlough, and none on long leave until health is re-established.

(*d*) Medical examination some months before expiration of leave.

The maintenance of health in the Tropics depends greatly on

(1) The Preparation for Work.

Among the essentials of this preparation are the enjoyment of a good rest and the careful getting of body and mind into their best possible condition.

Many young women who offer themselves as candidates for mission work have already been considerably strained by other work or study. Many of them are teachers or medical students, some of them clerks, accountants, or domestic servants. In all such cases it is essential that an interval of several months should intervene between the old work and the new. If this precaution is neglected, the candidate may go out at the expense of the society, only to cause disappointment by an early breakdown.

It may be suggested that each society's medical adviser should enquire into the candidate's recent circumstances, work, and method of life. This would lead to advice about a holiday and where to take it. It must be remembered that many candidates have poor homes in crowded cities, and that a holiday spent in hard work in such surroundings is certainly not a "holiday" as intended by a medical officer or an advisory board.

It may be considered Utopian, but really each society should have its "home of rest," to which it could send its candidates and missionaries when necessary. This might possibly be arranged in connection with the hostel or training college which many of them already possess.

Medical Examination.—Of course each society has its medical officer, and several of them have advisory boards which have been the means of greatly lessening the death-rate of such missions as the Universities' Mission to Central Africa, and others working in specially unhealthy climates.

Many applicants for missionary service are overstrained from study and other causes and hence a preparatory term of rest is very essential to prepare them for the strain of tropical research.

Many of the great missions publish information as to the preservation of health in the form of a printed letter or pamphlet, but it is perhaps desirable that in each number of the missionary magazines there should be a short paper dealing with some practical point, such as the influence on health of mosquitoes, of excessive rainfall, imperfect protection from the sun, errors in diet, clothing and housing. No doubt the magazines are intended to arouse interest in the work of the mission, but they are so much read by the missionaries themselves that they would be good channels for the diffusion of information on such important subjects.

It also seems as if the committees of our societies need to be begged to consider more carefully the reports of their medical officers, and to give effect to their recommendations in the selection of candidates. They should also consider their advice as to the correction of certain defects, especially those of the eyes and teeth, and as to the necessity for vaccination in all cases, and of inoculation with typhoid or plague in some special instances.

In the case of young women proposing to go out out as the wives of missionaries, there should be a special investigation as to their fitness for maternity. The external measurements of the pelvis should be carefully taken with calipers, and, if any obvious deformity exists, a further examination under anæsthesia may sometimes be proposed: loss of valuable lives and much hindrance to work being saved if it is clearly understood that in any given case the wife of a missionary is likely to need specially skilled assistance, and must therefore go for confinement to some centre where such assistance can be secured.

(2) Selection of Candidates.

In the selection of candidates the medical officers of missions are greatly assisted by the excellent tables of questions supplied by most missions, unfortunately not by all. These questions should be as minute and searching as are those proposed by life insurance societies. This precaution is the more imperative because candidates, in their zeal for service, sometimes, it may be unconsciously, give a most misleading account of their health and physical capacities.

There are certain facts in a candidate's history which must lead to rejection, while a still larger number make it necessary to give her acceptance only in the event of her fulfilling certain conditions. Among the former are unsuitability of age. Candidates who are too young and immature are a constant care to the older members of the mission, and they are specially liable to certain forms of illness. Candidates much above 30 years of age are generally unsuitable, because they fail to adapt themselves easily to trying climatic and social conditions; they have become more or less set in their habits of life, and do not readily alter them, as is really necessary in the different conditions of climate and surroundings.

The older candidates, as a rule, find more difficulty in learning new languages, and are less fitted to understand the philosophy and religion of those to whom they are sent. Judgment may be better in middle life than in youth, but memory, power to learn, adaptability, and readiness of sympathy are less. Besides all this, there is a constantly increasing chance that organic disease or chronic error of function may be present, rendering the individual less able to withstand the evil influences of bad climate and poor food.

Another point to be carefully considered is the existence of some defect which is likely to impair usefulness, such as lameness, lateral curvature of the spine, flat feet, and any marked deformity.

Amongst the causes of conditional acceptance which may be noted are certain defects which impair usefulness, chiefly those of the special senses, such as deafness and errors of refraction. Deafness in even a minor degree makes the acquirement of a new language difficult, and defective eyes are unduly tried by unfamiliar symbols of language. To all this must be added the fact that when general vigour diminishes under the influences of bad climate, inadequate or unsuitable food, and trying work, all special dis-

abilities become more evident, and lead to breakdown just as surely as do constitutional unsoundness or attacks of illness. Probably people who have sharp hearing and normal sight are quite unconscious of their advantages in the battle, and do not know how much more difficult things are for less favoured colleagues. Unless, therefore, such defects can be remedied, the candidate should be rejected in justice both to herself and to the society.

The undesirable possession of "nerves," or the being, what people call, with unfortunately a certain degree of approbation, "very sensitive and highly strung," is generally a bar to effective and enduring work, whether in community or as an isolated missionary. It is a very serious question as to how far the prolonged and heavy burden of modern education is responsible for this condition. This is not the place to discuss the distribution of responsibility among mental training, the unconscious education of home, and real hereditary peculiarities, but no matter how produced, such a condition of the nervous system is a very real hindrance to work, whether at home or abroad, and should be regarded as being sufficient to debar a candidate from acceptance.

In the same category must be put bad family history, especially if that family history be a nervous one. No doubt the different parts of the mission field have different characteristics, and there are certain portions of it that are specially trying to the nervous system, *e.g.*, Japan, North China, and Burmah. This leads on to the next subject—

(3) Allocation of Candidates to Special Work.

No doubt in many instances a candidate offers for some special work, and wishes, for instance, to be sent to Japan; but surely an essential part of the duties of the medical advisers to the societies is to consider the fitness of the candidate not only with reference to mission work in general, but for that special branch which she is anxious to undertake. To send a girl of obviously unstable nervous constitution to Japan would appear to be as wrong as to send another who has already suffered from malarial infection to the West Coast of Africa. All tropical climates have certain drawbacks in common, such as heat, undue moisture, presence of mosquitoes and other undesirable insects, but in addition there are peculiarities in nearly all these climates, and in advising societies as to the allocation of missionaries, it is desirable that the medical officers should know all that is possible for them to know as to these peculiarities, and also that they should study each individual case with a view to distributing the material as suitably as possible.

(4) Care of Health on Active Duty.

There is a very regrettable waste both of life and health which is not really unavoidable. The climate in which the worker finds herself may be far from ideal, but in too many instances the missionaries, especially the younger missionaries, appear to absolutely court disaster. They remind one so much of the fatal remark made by Lord Methuen at the commencement of the South African War; he said: "This is a war in which it will not be etiquette to take cover"; there spoke no doubt the courageous and gallant commander, but not the wise and successful leader of men.

Probably all doctors who have seen much of young women missionaries in the Tropics have found in them an heroic disregard of the most obvious precautions which ought to be taken as a matter of duty and common-sense by all residents in tropical climates. Some of this recklessness may be due to fiery zeal, beautiful and impressive, but not useful, which is more or less inherent in young people, but much of it is also due to the appalling ignorance of sanitation, hygiene, and physiology, so common in the present day. "The people is destroyed for lack of knowledge, how shall they know unless they be taught," and who is there to teach them. In our schools, whether for rich or poor, everything is taught, from the alphabet to the piano with the exception of what really concerns the pupils to know, their duty to God and their duty to man, including their own bodies. How can we expect people who live in rooms habitually over-heated and ill ventilated to understand the value of fresh air? How can we expect girls who have never been in the kitchen and who know nothing about food to make thrifty and intelligent mistresses of missionary families or wise home-sisters to a community.

As to the question of drink, there is no doubt that the great majority of people working in the Tropics would be much the better for avoiding the use of alcohol as a beverage. Missionaries generally comply with this rule, probably more from a desire to set a good example to their scholars and converts than from motives of hygiene; there is, however, no doubt of the folly of taking alcohol in climates where the inevitable weariness and lassitude are so likely to lead people on from a harmless minimum to a maximum which is incompatible with health of body or mind.

To maintain health in the Tropics many habits of daily life need revision. Ordinary English folk eat too much meat, and, indeed, too much food altogether. The attempt to do this in a tropical climate is sure to lead to disorders of digestion and chronic ill-health. Plenty of milk, bread, butter, vegetables, and fruit, with relatively little meat, would be a more suitable dietary than the heavy breakfast, lunch and dinner which is usual with Europeans in India.

Another very serious danger to health in the mission field is the difficulty of procuring good milk and pure water.

Milk is not attainable in some places, in others it is very poor in proteids and in fats; in nearly all stations it is liable to contamination with dirty water, or by being drawn from unwashed udders by dirty hands. The wonder is, not that typhoid, dysentery, and other microbial diseases are conveyed by milk, but that any one escapes infection. The only way to guard against such illness is for some responsible person to see the cows milked and to insist on the observance of all reasonable precautions.

The storing of milk is a difficulty only less urgent than ensuring its original purity. In hot countries milk is a highly putrescible fluid and rapidly becomes unfit for use. This difficulty, like the difficulty of guarding against its containing germs of tubercle and other diseases, is met to some extent by boiling or

sterilising. Neither of these methods is wholly satisfactory, for even sterilisation affects the food value of the milk.

Water is the staple drink and also the most frequent vehicle of disease. The source of water supply, whether river, well, or tank, is too often open to the grossest fouling; one and the same collection of water being used as sewage carrier, as washing ground, and as drink for man and beast.

The carelessness of all concerned, Government, missionaries, European residents and natives, is marvellous. The merest common-sense should enforce the rule, "The rain to the river, the sewage to the soil," but no, those who should know better allow the sewage to enter the river, while the rain collects in shallow depressions round the houses. Typhoid, cholera, dysentery and malaria follow in the ordinary course of Nature, and those whose ignorance and carelessness have caused the catastrophe talk of heroic self-sacrifice and the deadliness of the climate—truly "the people is destroyed for lack of knowledge."

The water supply can never be trusted, and the only safeguard is to drink none that has not been boiled and kept covered from dust and other sources of contamination.

Choice of Houses, Construction of House, Selection of Sites.—In well-settled countries, such as many parts of India and China, the individual missionaries find their houses ready for occupation, and have no responsibility as to choice of site or construction of house. A heavy responsibility does, however, rest upon those who choose the house itself. From a desire that the missionaries should live as much as possible amongst their people, the heads of missions too often select houses in the native quarter of the town. Such houses are very likely to be built on native principles of sanitation and comfort, which it is needless to say are neither suitable nor desirable for Europeans. In many cases they are in immediate proximity to the open gutter, which serves the purpose of a general sewer; ventilation is conspicuous by its absence, and there is a general want of convenience and comfort. Far worse than this, there are the many diseases which are immediately communicable from man to man, either directly or through the mediation of mosquitoes, flies, ticks, &c. Europeans living in the native quarter are exposed to all these dangers, and also suffer from the absence of open spaces, proximity to the country, or the sea-shore.

Of course, every one understands the desire of the missionaries to be near their work and amongst their people; much fatigue and expense is saved by not having to make journeys to and fro, and another inducement is undoubtedly the hope that by living a Christian life in the midst of their heathen neighbours their example may be like "the city set on a hill which cannot be hid." All the same, it is to be feared that the balance swings entirely towards evil rather than good, for it is not possible for Europeans living under such circumstances to maintain their health, and with the loss of health comes loss of efficiency, and in many instances loss of temper and of many of the moral qualities which are so necessary in dealing with the heathen and with converts. It should therefore be a matter of principle with those responsible for such matters, that missionaries' houses should be sufficiently removed from native quarters to enjoy an abundance of air and sunlight; they should, if possible, have upper rooms in which to sleep; the trees should not be permitted to grow too close to the house; and all shallow tanks and puddles should be filled in. Beyond all these things, it is necessary to see that the servants' quarters are as far removed as possible from the house. It is now well known that mosquitoes are the carriers of malarial infection, and that few native children are not hosts of the malarial parasite; if, therefore, the servants' quarters are near to the house, there is nothing to prevent the mosquito from carrying the malaria from one to the other.

There is real sense as well as economy in having but little furniture and no hangings in tropical houses. Any curtain or garment hanging up is simply a hostel of which the mosquito avails itself freely; sheets and clothing having been hung in the sun to dry ought to be folded up and put away into bureaux or boxes, for when they hang in the sleeping rooms they become a positive danger.

It is a distinct advantage to have fine woven wire to fit into the windows and doors, made so that they can be open in the day and closed at sundown. The mosquito is chiefly a nocturnal creature, and ought, if possible, to be excluded from the dwelling.

An excellent modern device is a sort of small tent of gauze within which a chair and table can be placed. This enables any one to read or write without the annoyance and danger of being bitten by mosquitoes. Among minor safeguards are the rubbing of the skin with oil of lavender and the wearing of high boots, putties, or gaiters.

It often happens that in breaking fresh ground and laying the foundations for a new mission station, the responsible head has to choose a site which shall be suitable for the mission houses. This should be, if possible, on a sloping ground with no houses above it. The servants' quarters should be a considerable distance away and at a lower level. It is also most desirable that there should be no half-way house between the European and native quarters, for the mosquito is capable of flying about 500 feet., it then settles on some vantage ground, and gathers strength for a further flight. Abundant provision should be made for dealing with refuse and with household slops. It is absolutely immoral to permit excreta and rubbish to foul running water or to enter a lake, tank, or well. There is no doubt that the earth system is the only one practicable, but this demands very careful management or the heavy rain will wash away both earth and excreta, fouling all the ground in the neighbourhood.

Another point that should engage the earnest attention of the selector of a site is that there should be no swamp or marsh in the neighbourhood. There was a great deal of unconscious wisdom in those of old time who spoke of malaria as "marsh fever," for although it is by no means a miasma or an emanation from marshy soil, yet shallow and stagnant water affords a breeding ground to the mosquito, which is itself the cause of the scourge.

It is curious to look back to one's student days and to remember how we were cautioned to advise

travellers to encamp to the windward of groves of trees or of running water; of how they were advised to kindle fires between themselves and the marsh, and how it was supposed that the deadly miasma was of so particulate a nature that it it did not readily pass through the meshes of a mosquito net, in the same fashion as it was known that fire-damp did not pass through the closely woven wire gauze of the miner's safety lamp. All these facts were true, but our interpretation of them was erroneous.

In the matter of the construction of a house much must depend upon the materials available, but it has been abundantly proved, especially in the history of the Universities' Mission to Central Africa, that the health of the missionaries is much more stable in well-built houses whose walls are thick, whose foundations are well laid, and in which there is an abundance of air without draught and without exposure to wet mists. No doubt pucka-built houses are more expensive, whether they be fashioned of bricks, stone, or rubble faced with chunam. There was no doubt cheapness, immediate economy, and perhaps some romance in living in wattle and daub huts thatched with palm leaves; but after all, nothing in the mission is so valuable as the health and lives of its members, and therefore no expense within reason can be considered extravagant which really secures their safety.

Amount of Work, Exercise, and Rest.—There is no doubt that owing to zeal and enthusiasm outstripping discretion, many missionaries, and espepecially the younger members, are extremely careless about their health. When they first come out they are in most instances quite ignorant of the dangers of the climate, and even if they understood they would be disposed to think that their good intentions would protect them from harm. It is very difficult to persuade new-comers that the tropical sun is deadly, and that it is not safe to walk out (except in the very early morning and evening) without the protection of pith helmets, white-covered umbrellas, and dark glasses. It is also difficult to make new-comers understand that active and outdoor work ought to be accomplished as far as possible in the cool of the morning or evening, while the middle of the day should be devoted in part to learning the language or other mental occupations, and that, having in view the very early hour of rising in the morning, some two or three hours should be spent in rest.

Another danger which is not generally appreciated at its right value by the young and enthusiastic is that work of all kinds should be taken quietly and steadily, that there should be no rush or worry over it. Some of the young missionaries feel that every day spent in the acquisition of the language is a day lost to their Master's service, and they consequently are anxious either to scamp this most necessary part of their preparation, or to work so hard that eyes and brain are alike overstrained and injured. No one can say how many hours a day any one ought to work, this must be a personal question, for whereas one individual can work at the language with impunity for five or six hours a day, other less mentally robust individuals cannot do more than two or three hours without danger of "knocking up."

Exercise is a duty greatly disregarded, especially by women in tropical climates; they suffer much from lassitude, and the slightest exercise is liable to be accompanied by profuse perspiration, and by development of prickly heat; they are therefore disposed to shirk physical exertion as much as possible. This, of course, leads to indigestion, constipation, and frequently to sluggishness of the liver and headache. Unfortunately most people have an idea that these ailments are to be remedied by drugs, and they are very unwilling to follow the natural and proper course of increasing their exercise; others have a belief that any exercise beyond ordinary walking, such, for instance, as croquet, lawn tennis, and cricket, are of the world, worldly, and unworthy of the enthusiastic and devout missionary. It is quite necessary to persuade them that so long as they are under earthly conditions they need to take ordinary care of their health, and that the form of exercise which is found to promote that is the one by which they can best honour God. It appears to be greatly a matter of habit, for thousands of Europeans keep themselves in excellent health even in malarious and trying climates by taking regular and steady exercise, by working reasonably, by resting sufficiently, by eating suitable food, and in one phrase by "walking in the paths of physiological righteousness."

Care of Minor Ailments, Chills, Slight Fever, Diarrhœa, Toothache.—There is a good old saying, "Take care of the pence and the pounds will take care of themselves," and one would fain remind missionaries and other dwellers in tropical lands that if they would attend to slight ailments there would be a much better chance of remaining free from grave disease. Many an apparently trivial indisposition is either the commencement of real trouble, or at any rate prepares the way for catastrophe; *e.g.*, a heedless new-comer finds it delightful to sit on the roof of the house or on the verandah after the evening meal; they attribute no importance to their damp garments and perhaps chilly sensations; it is not until fever or other serious trouble develops that they can be brought to realise the unwisdom of their pleasant rest.

All rapid chilling of the skin, and dampness, even although slight, is of far more importance in tropical than in temperate climates, and ought to be carefully avoided, chiefly by wearing thin woollen garments next to the skin, and by providing light woollen or silken wraps to put on when driving after sundown, sitting out, and after getting hot with taking exercise.

A very slight deviation from health in the matter of indigestion or of diarrhœa should be carefully treated by rest and by minute regulation of diet. Of course the old wives' fables about the diarrhœa which became cholera can be classed with the similar fable of a quinsy which became diphtheria. We know that grapes do not grow from thorns, nor figs from thistles, but the gastric and enteric catarrh may prepare the soil for the germination of the vibrio of cholera, just as the inflamed tonsil is a ready breeding ground for Loeffler's bacillus.

Perhaps the heading of *toothache* may excite a smile, but it is one of the most harrassing and incapacitating of ailments, and seriously interferes with

the duties and happiness of life, and not only so, but when abscesses form at the root of the teeth and a condition of pyorrhœa alveolaris develops, the individual's standard of health will certainly be greatly lowered, and it is very probable that serious illness may follow. Dr. William Hunter has taught us the intimate connection between some forms of pernicious anæmia and oral sepsis, while other observers have pointed out a similar connection between oral sepsis and a form of rheumatoid arthritis.

(*e*) *Dangers of Mosquitoes, Flies and Ticks.*—Enough has probably been said of the dangers of mosquitoes and of some of the methods of minimising them, but a brief *resumé* may be useful.

It is now generally recognised that mosquitoes are the intermediate hosts of the parasites which cause malaria and yellow fever. Many experiments have been made, and the evidence inconclusive, men may live safely in the most malarious districts *provided* that they can protect themselves from the bites of mosquitoes. On the other hand, people may be bitten by infected Anopheles here in London, and will in due time develop malaria.

The great problems are:—

(1) How can the Anopheles be prevented from breeding near human habitations?

(2) How can Europeans defend themselves against the bites of these small assassins?

The Anopheles breed in shallow and stagnant water, therefore houses should not be built near any swamp or marsh, nor on ground in which there are shallow depressions liable to be filled by rains; the neighbourhood of irrigated lands is specially to be avoided. All marsh-land should be drained, if possible; puddles and shallows should be swept out and dried. Sometimes coating with a film of paraffin is easier. All windows and doors should be fitted with fine wire gauze shutters, which must be closed at sunset. The rooms should then be fumigated, and all parts of the sleeping rooms should be thoroughly searched and flapped with towels to disturb and kill any sleepy mosquitoes. All beds should have sound and good mosquito nets, and a portable canopy should be used by each individual in the evening—a canopy under which a table and chair can be placed.

Any one walking out after sunset should protect the feet and ankles with gaiters or putties, and all exposed parts of the body, such as the face and hands, should be smeared with lavender oil.

As said before, native huts must not be built near European houses, and native children must not be allowed about the house or verandahs.

It is also certain that disease may be propagated by various kinds of flies, and there is a fever known as "tick fever." One of the commonest troubles in some parts of the mission field is a particular form of purulent conjunctivitis, the infection of which appears to be carried by eye-flies. In this case, again, the fly would appear to be, at any rate, the agent by which the infection is transferred from natives to Europeans.

(*f*) *The Annual Holiday and the Home Leave.*—These breaks in mission service are absolutely essential to the maintenance of health and of efficiency. Most workers find that a yearly holiday is essential even in a temperate and healthy climate, still more is it urgently needed by those who work under the great strain and stress of a hot, moist climate, combined with heavy work, much anxious responsibility, and constant exposure to disease. In most cases a healthy holiday may be had each year by a visit to the hills, or by going for a sea voyage. Leave time should be enforced after two years' service in exceptionally bad climates and after five years in less trying stations.

(*g*) *Daily Dose of Quinine.*—When living in really malarial districts and on the march, it is right to take daily doses of quinine—two grains with the early tea, and one or two after lunch and dinner. Few people cannot take quinine in some form, and even the large doses which are necessary to prevent an expected attack may be taken without unpleasant consequences if mixed with hydrobromic acid. It is to be remembered that when once malarial infection has been established a recrudescence is easily provoked by chill, exposure to the sun, fatigue, and indigestion.

A patient suffering from malaria must be carefully protected from being bitten by mosquitoes, for they suck in the germs of the parasite with the blood of the invalid, and subsequently inject them with their saliva into other people. In this sense, and in this sense only, is malaria infectious.

(5) Care of Health when on Furlough.

(*a*) *Medical Examination and Advice on Arrival.*—It is impossible to urge too strongly that every missionary should be seen by the medical officer of the mission immediately on return from abroad. Cases constantly occur in which missionaries who have been invalided home at the end of their term of service fail to report themselves on arrival. The idea is that merely coming home will cure their ailments, and consequently they drag on, their dysentery becoming chronic, their malaria smouldering, and their anæmia scarcely relieved. They think they ought to be well, and act as if they were well, eating ordinary diet, incurring considerable fatigue, and steadily preparing themselves to join the ranks of the non-efficients.

If all missionaries were seen and examined on return and submitted their "health history" to the medical officer of their society, they would receive valuable advice and treatment which would generally ensure the re-establishment of their health, and enable them to return to the field with renewed health and capacity for work. In some few cases the medical officer or the advisory board would report that the missionary was unsuitable for the foreign field, and should be employed at home or struck off the active list. Such a decision, although no doubt reluctantly made and full of sadness, would often save the life of the missionary, and would defend the mission from serious pecuniary loss. No one should be permitted to return to the field who had suffered from blackwater fever, frequent attacks of ordinary malaria, repeated attacks of dysentery, and, above all, those whose nervous systems could not stand the storm and stress of climate and work.

The medical officers would also be able to advise returned missionaries as to work while on leave.

Some missionaries wish to employ part of their holiday in study; for instance, men desiring to take

holy orders, men and women doctors anxious to obtain superior qualifications or increased experience. In many cases this may be permitted, and the medical officer will be able to offer advice as to opportunities for study and possibility of assistance. In other cases the missionary may be able and willing to do deputation work, or otherwise to assist the society while at home, but no one should be permitted to work without being examined and passed as fit.

(*b*) *Choice of Locality for Holiday.*—Another point on which advice is likely to be needed, but is not likely to be sought, is on the subject of where to spend the holiday. Many missionaries are members of poor families, their relations live in small houses, badly situated and badly found in all respects. All of us can remember instances in which the weary, toil-worn missionary returns to a poor and comfortless home, to worse food than she had while at work in the field, and sometimes to be the domestic drudge, or the willing but most unsuitable nurse to a home invalid. Can it be wondered at that furlough so spent fails to do good, and that the missionary's subsequent record is disappointing? Modestly and simply as our brothers and sisters live in the field, inferior though the meat, bread and milk undoubtedly are, yet they enjoy perpetual open-air life, a comparatively abundant service, and a blessed absence of pecuniary cares. When they come home, the advantages of climate are sometimes greatly minimised by the circumstances of their homes. Some one on the home staff should know the circumstances of each member of the mission, and should be in a position to offer hospitality for a portion of the leave at a hostel or home of rest connected with the mission.

It might be possible in some missions to have a holiday fund from which grants could be made in certain cases to enable those who could not otherwise afford it to go to the country, seaside, or wherever the medical officer might think best.

(*c*) *No Deputation Work on Short Furlough and none on Long Leave until Health is Re-established.*—When missionaries come home for really short periods, say for six months or less, it is not desirable that they should do any deputation work. Their time for rest and refreshment is short, and should be spent in recovering health and elasticity; the policy of permitting them to work during short leave is mistaken and shortsighted. When the leave is longer, deputation work may be permitted, but only when sanctioned by the society's medical adviser. Some people, men as well as women, have no gift for public speaking, and suffer acutely from nervousness on such occasions. They should not be subjected to this trial.

(*d*) *Medical Examination some Months before Expiration of Leave.*—*Finally*, no missionary should be permitted to return to duty without the written sanction of one of the society's medical officers. This sanction should be sought in good time, otherwise unnecessary expense and annoyance are caused by the preparation of outfit and the securing of a passage.

Usually two months will amply suffice, for it is pretty certain that a missionary due to return to work in October should be able to pass the medical examination in August. It would usually suffice for the society to nominate a trustworthy practitioner in the nearest town to the place where the missionary was living.

SOME STRIKING FACTS ABOUT AN EASTERN CITY.

By R. H. Bremridge, M.A., M.B.Oxon., B.Sc.Lond.,

Bangkok, Siam.

Situated at the mouth of a very large river and in about the same latitude as Madras, is a city with about three-quarters of a million inhabitants. At least half of these are Chinese, and the remainder, with the exception of some other Asiatics and a few Europeans, is made up of Siamese. Bangkok, for that is the name of the city, is surrounded by flat, low-lying, very marshy country, and has a mean temperature of about 83·5° F., and a rainfall of 46·5 inches. Strong winds do not prevail, and there are many collections of water with a constantly smooth surface most convenient for the breeding of mosquitoes. Moreover, there are vast hordes of mosquitoes and many Anopheles among them. Everything would seem to have been arranged by Nature to promote malaria, yet there is very little in the town itself. Severe cases come in from the country, but among the genuine town-dwellers malaria is certainly far from common. An American doctor, of nineteen years' experience, stated lately that he did not think he had seen twenty cases of malaria among genuine town-dwellers. Such a statement is open to criticism, but it serves to show that malarial fevers are infrequent.

It is not possible to get the mortality figures or case incidence of any disease—there are no such records. However, by collecting the experience of credible European doctors in charge of the police, army, navy, jails, &c., &c., a shrewd guess may be formed.

The laws and regulations for the care of the public health are easily described. There are not any. Docketed away somewhere in a dusty pigeon-hole there may be some, but for all practical purposes the layman is never made to know them.

Running along the front of the houses are open drains, into which it would appear anything may be and everything is thrown. These drains empty themselves, when they are not stagnant, into the various canals, and the canals intersect the whole city, forming one of the chief methods of communication.

Many houses face on these canals and derive their water supply from them, and that not after any method of filtration, but directly. Such water is used not only for all domestic purposes, but also for cooking and drinking.

The central jail, in which are approximately 2,000 prisoners, empties its surface water and liquid refuse into a canal about the size of that in Regent's Park, London. The jail takes its water supply from the same canal, and at a place some few yards from the position of the sewage outlet.

For the general use of the town there is no water supply other than the canals. True, one or two arte-

sian wells have been already bored, but as yet they do not seriously, if at all, affect this statement.

Typhoid and Cholera. Typhoid is not a common disease, and cholera, though continually present, does not assume the proportions of even a moderate epidemic.

Be it known that the stench from the open drains is truly dreadful, and that during the dry season, when the canals are quite empty at low water, the flushing of many of them is practically a negligible factor. Yet it is quite usual to see men, women and children living and having their being alongside these drains, and in this atmosphere of stink. Moreover, they look and seem well.

Plague has recently appeared among us, and some European doctors predicted and feared terrible consequences. A case of plague has occurred here and there at lengthy intervals, but the records have not yet attained epidemic proportions, yet everything would seem to be in favour of the plague.

Some parts of the city, notably the Chinese quarter, is crawling with humanity. Here land is sold by the square inch. Everything that can be called a house is full from the floor to the ceiling, and the mainway between the houses is but a narrow path. There is no drainage, no water supply, no anything, and, strange to relate, no plague. Why, no one knows.

To deal with such a place according to the most elementary ideas of sanitation means its entire destruction as the only possible beginning, and this would cost about six times the annual revenue of the country.

Bangkok would be to a man of fixed ideas about sanitation nothing less than an awful nightmare, and yet it is not over unhealthy. Indeed, the general look of the European women and children is better than in many well-cared for stations in India. They are not pasty-looking and tired, and they are not ill.

It is difficult to resist asking one's self the question, whether it would not be unwise to interfere here, and graft a partial European system, almost inevitably indifferently carried out, on the present order of going. Now, there would seem to be some sort of natural balance set up between the contending micro-organisms, and that in the fight for existence among themselves they are protecting us "humans." To alter the whole place immediately, and put everything under human control, is impossible. The necessary engineering work is lengthy and the cost enormous. Half measures may mean a disturbance of the already existing balance, and the ultimate result a less healthy city. It must always be recognised that to disturb a natural arrangement unless you can see far ahead may in the end be most disastrous.

Witness the island of Jamaica. To kill the rats infesting the sugar cane the mongoose was introduced; the rats were exterminated; the mongoose then became a plague, and has got rid of all the lizards, harmless snakes and small birds. As a consequence insect pests abound, and among them is a troublesome tick, which destroys the cattle. This tick having had all its enemies removed by the mongoose flourishes luxuriantly. The last state of Jamaica is worse than the first. Bangkok may repeat the history of Jamaica. Improvements may not lead to such satisfactory results as were anticipated.

Give Bangkok closed drains and all that goes to make up a sanitary paradise, and Bangkok may during the years of changing have epidemic plague and epidemic cholera, and malaria in plenty. Be that as it may; constituted as it is to-day, without any efficient machinery to ascertain the numbers, and causes of death, without any drainage, without any water supply, without any registration of accredited apothecaries, much less doctors, without, in fact, anything but the barest skeletal beginnings of medical control, Bangkok has all the possibilities of becoming a very volcano of pestilence, and perhaps a fortnight of unusually cold weather, or something equally trivial, will start the eruption.

Sea Voyages for Invalids.—The discussion on "Sea Voyages for Invalids," published in the *Journal of Balneology and Climatology*, January, 1906, provoked a number of opinions as to the advantages and disadvantages of sea travel for invalids. The consensus of opinion, including that of Dr. Robert W. Felkin, who opened the discussion, seemed to be, as a rule, against the treatment. He stated that the principal ailments which precluded a sea voyage are: (*a*) The strength of the patient—if there is too great exhaustion it is better to keep him on land; (*b*) grave dyspepsia; (*c*) hepatic enlargement; (*d*) cardiac dilatation; (*e*) pyrexia or any inflammatory condition; (*f*) any tendency to hæmorrhage; (*g*) epilepsy; (*h*) insanity; (*i*) pregnancy; (*k*) patients suffering from eye diseases; (*l*) any kidney disease; (*m*) phthisis, except, perhaps, in the very first stages, and I think even then such a patient should occupy a deck cabin *alone*." Dr. F. Sandwith's remark that:—"The doctor who sent many patients to sea was generally one who had not done much travelling in bad weather," succeeded best perhaps in summing up the situation. Chloretone was mentioned by Dr. Leonard Williams as the drug which had proved most successful in alleviating sea-sickness.

The *Geographical Journal*, for March, 1906, contains a useful abstract of a paper by Dr. J. Hoffman, in Petermanns *Mittellungen*, 1905, Nos. 4-7, on Minimum Temperature in Tropical Africa. The area dealt with is the south equatorial region, more particularly the high plateaux of East Africa. The author discusses the effect on the minimum of temperature of elevation, distance from the sea, rainfall and winds throughout the year, and attempts to deduce some general laws therefrom. He finds that the minima diminish with distance from the coast, and increase of latitude, but the variation with altitude cannot be stated simply, as the diminution is affected by many disturbing factors.

The facts are different, *e.g.*, for stations on a mountain range, on a plateau, or on the slope of an isolated peak rising from a plain; the general law of diminution for elevation holding good least of all for a mountain region cut up into valleys. Humidity and cloudiness are also disturbing factors as illustrated, for example, that under these circumstances a minimum of 39·2° F. was observed at 2,675 feet, near Rinvenzori, whereas so low a temperature had never been recorded up to 6,230 feet on Kilimanjaro.

The important question as regards agriculture, of the limits of night frosts is also considered and the conclusion arrived at is that, near the equator, there is no good evidence of actual frost at any height under 6,500 feet, though cold nights approaching freezing point are not uncommon.

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APRIL 16, 1906.

THE DAILY RANGE OF HEAT AND HUMIDITY IN TROPICAL COUNTRIES.

OF the different meterological data that are required for the comparison of climates, there is no one as to which so much misapprehension exists as to that of humidity. The reason of this is to be found in the fact that direct quantitative figures are absolutely useless for comparative purposes, as such figures convey no idea whatever of the dampness or otherwise of a place. Even in the heart of the Sahara, the actual weight of watery vapour present in the air seldom, if ever, is as small as it is in London during a November fog; but in spite of this, the fierce dryness of the desert in June rivals for inconvenience the damp misery of a "London special."

The reason of this is that the amount of water that the air can carry without deposition varies with the temperature, and that it is only when the air approaches saturation that the sensation of damp is conveyed. Under other conditions, watery vapour is as "dry" as any other gas, for our sensations inform us not as to absolute but to relative dampness. Macaulay's schoolboy would probably have been aware of this had he belonged to the present generation; but what is not generally recognised is the corollary that, with the daily changes of temperature, relative humidity is constantly changing from hour to hour, and that consequently observations from different places are in no way comparable unless they are taken at corresponding hours of the day. For strict comparison of places widely differing in latitude, it is not sufficient that they should be taken at the same hour of the day, as owing to the great differences in the length of the daylight hours at different latitudes, observations at the same hour are only exactly comparable at the equinoxes. At all other times of the year equatorial climates are made to appear comparatively too dry in the winter and too moist in the summer, as for comparative purposes, where only one or two observations are taken during each day, it is essential that they be taken, not at the same hour, but at the same interval from sunrise and sunset. Observations such as this, necessitating different times of observation for each month, are, however, almost out of the question in actual practice, and fortunately, within tropical and subtropical limits the day does not differ sufficiently in length to seriously vitiate the comparison of observations taken at fixed hours. But even in stations under the same flag, the hours of observation vary greatly, and nowhere more so than in our British colonies, so that it cannot be too clearly understood that comparisons of relative humidity are usually utterly fallacious unless it be clearly recorded that they are taken at the same hour, or that careful and somewhat difficult corrections be made to compensate for the different times of observations.

In humidities of about one-third of the possible water-holding properties of the air, it happens that a rise of one degree Fahrenheit in temperature corresponds almost exactly with a fall of 1 per cent. of relative humidity, and it is therefore convenient to commence our study of the normal curves of these two climatic factors with an example of a climate of this sort. The number of stations where hourly observations of sufficient duration have been taken is but small, and we are therefore somewhat restricted in our choice; but the case of the climate

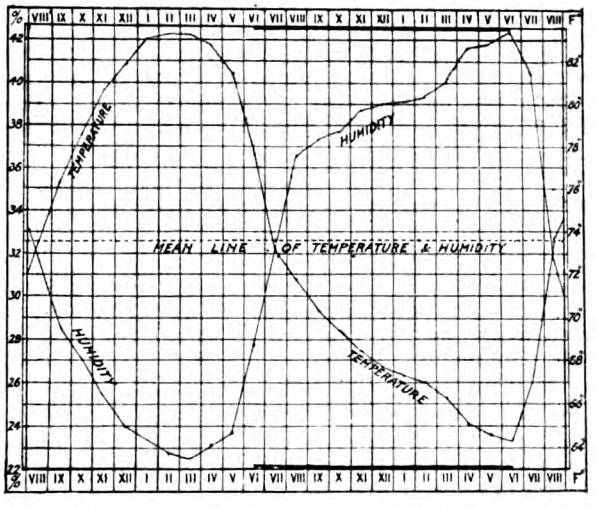


FIG. 1.—Diagram of diurnal variation of temperature and humidity at Pachmari during March. The figures on the left refer to percentage humidity, those on the right to temperature (Fahrenheit). The heavier horizontal border lines indicate the hours of darkness.

of Pachmari, in the Central Provinces of India, for March, which is graphically represented below, will serve sufficiently well for our purpose.

The first point that strikes the eye in examining these curves is their almost perfect symmetry, which is the more remarkable as they are plotted from the data of a single month; and we may be sure that in a term of years the curves would smooth out to perfect regularity. This is, of course, only what is to be expected from the ordinary law of physics, and is merely an expression of the fact that the *absolute* amount of watery vapour in the air can vary but little from hour to hour, save in exceptionally circumstanced localities, such as those influenced by diurnal land and sea breezes.

It will be noticed that both curves start from the mean line about 8 a.m., and leave it in opposite directions. At first very rapidly and then more slowly, till they respectively reach their maximum and minimum points, which in the case of temperature is reached about 2.30 p.m., and of humidity shortly after, at 3 p.m.

From this time the changes are slow until 5 p.m., after which the fall of temperature and rise of humidity are extremely rapid until 8 in the evening, the mean line being crossed about 7 p.m.

From this time the temperature falls and the humidity rises steadily till 6 a.m.; after which, with the rising of the sun, both lines turn steeply back to regain the mean again at 8 a.m. It will also be noticed that while the curves of the heat of the day form bold and fairly symmetrical loops, those of the cooler hours are quite different, the fall of temperature being very slow in comparison with the rapid rise after dawn. Now, 7, 8 and 9 in the morning are very favourite fixed hours for taking meteorological observations, and it will be observed that two observatories placed side by side at Pachmari, one of which observed at 7 a.m., while the other did so at 9, would record relative humidities of 40·5 per cent. and 28·5 per cent. respectively, while the difference between 7 and 8 a.m. is quite sufficient to give an entirely erroneous impression of the comparative dryness of the two really identical places. It might at first sight be thought that a single observation taken about 8 a.m. would give a very close approach to the mean temperature, but a moment's inspection of the curves shows that they are so steep at both of the points where they cut the mean line that a very trifling lack of punctuality would seriously vitiate the results, as the conditions change at these times of the day as much in a few minutes as they do in an hour when approaching the maxima and minima. Many observatories take their observations at 9 a.m., 3 p.m. and 9 p.m., but on this plan two of the three observations are too near the mean to be at all independent of exact punctuality, and the mean of the three will necessarily be much in excess of the true mean.

At Cairo and some other first-class observatories, observations are taken at 6 and 9 a.m., 3 and 6 p.m., and midnight; and such a series gives a close approach to the true mean of the year, but it cannot be trusted in the case of individual months, as a very casual test of the plan brought to light months in which these data yielded results as much as 2·5 per cent. different from their true mean, which is no better than is afforded by the mean of the maximum and minimum humidities alone, without taking any other data into the calculation. On entire years indeed, mean humidities calculated on this latter plan seldom err by more than 1 per cent., so that though for annual figures the plan of five observations may be admitted to give a closer approach to the true mean, its advantages over the simpler method are quite inconsiderable.

But elaborate observations of this sort are only possible in observatories of the first class, and we are probably well within the truth in surmising that the stations where they are taken might be numbered on the fingers for the entire British Colonial empire.

Moreover, unless they be supplemented by separate figures obtained on some simpler plan they are quite as useless for purpose of comparison with the great bulk of stations as those of the humblest observatory with its single part-time observer, from whom at most but two daily observations can be expected. We have already seen that morning and evening observations are undesirable, because at these times of the day the changes are so rapid as to lay them open to many fallacies, not the least of which is that even in sub-tropical regions the varying length of the days will bring about considerable differences in the apparent results of different months.

We are thus reduced to observations taken near the maxima and minima, but one of these occurs at night, and the other in the busiest hour of the day, and so cannot be reasonably expected from part-time observers.

We are reduced, then, to the necessity of employing self-recording instruments; and as thermographs and other continuously recording instruments are expensive, delicate, and troublesome to manipulate, we are practically reduced to the employment of maximum and minimum thermometers which are open to none of the above objections.

In other words, it is proposed to employ wet bulb maximum and minimum thermometers, and to employ these in conjunction with the corresponding dry bulb instruments to calculate the maximum and minimum humidities. The only objection that can be advanced to this proposal is that the wet bulb extremes do not always coincide in time with those of the dry bulb. Now, the principal reason of this is that wet bulb thermometers move more slowly, and therefore have a tendency to lag behind the dry instruments, but the same objection may be taken to all hygrometric observations deduced from these instruments at any possible time or combination of times; and though irregular factors may slightly vitiate the advantages of the proposed plan in fickle climates, such as that of England, an examination of the above and following curves, as well as many others that have been plotted, shows that this source of error cannot be considered as of any practical importance in the case of hot climates. Moreover, in the case of temperate climates the irregular factors of this source of error necessarily have a tendency to correct each other in any at all extended series of observations, even such as a month. Above all, the results of the plan would be strictly comparable, a character entirely wanting in our meteorological returns as at present constituted.

The accidental relations of a change of 1° F. in temperature, corresponding to 1 per cent. of relative humidity is, however, confined to very dry climates.

Under conditions of greater moisture, the percentage of humidity alters much more rapidly than the temperature, as expressed in degrees Fahrenheit; so that at humidities of about 65 per cent. a change of 1° F. corresponds to a change of 2° F., and in ordinary equatorial and insular warm climates, the proportion is even higher, and may reach as high as 2·4 per cent. of humidity to the degree Fahrenheit; though in exceptional cases, as in the almost saturated climates of tropical hills, there appears a tendency for the ratio to fall as saturation is approached.

These relations between changes of temperature and moisture appear to be fairly constant, and are represented by the diagram below (fig. 2).

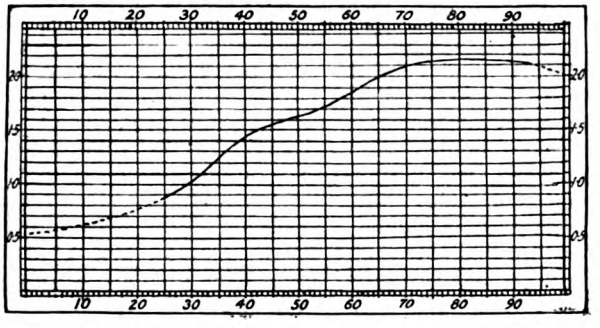


FIG. 2.—Curve illustrating the relation between the ranges of temperature and humidity at varying degrees of atmospheric moisture. The horizontal borders are graduated to percentage humidity, the vertical to the factor by which an alteration of temperature must be multiplied to obtain the corresponding alteration in relative humidity, *e.g.*, the curve cuts the vertical of 30 per cent. at 1·, at which humidity an alteration of 1° F. corresponds to a change of 1 per cent. relative humidity, while at 63 per cent. humidity a change of 1° F. is associated with that of 2 per cent. relative humidity.

The information so afforded is necessarily only approximate, and has been obtained in a purely empirical manner, but is really of practical value, when it is desired to make a comparison of data collected at different hours, the more as the mean temperature does not appear to notably affect the ratio, at any rate within the climatic limits we are considering. On this account it is commonly more convenient in diagrams to plot the changes of humidity on half of the scale of those of temperature, and this plan is adopted in fig. 4, the last of the instances plotted.

Moist air is a much better conductor of heat than dry air, and also obstructs radiation, much heat being absorbed instead of passing through it. Changes of temperature are therefore much less rapid in moist climates, and the diurnal range of temperature much smaller. These differences are graphically illustrated in the contrasted ranges of temperature and humidity of the very dry climate of Jaipur in Rajputana for the months March, April and May, with those of Rangoon in Burmah for the months July, August, and September, though the mean temperatures of the two stations (78·7° F. for Rangoon and 84·1° for Jaipur) during those periods do not differ greatly. The mean humidity of Rangoon, however, during the period in question is 92·7 per cent., while that of Jaipur is but 33·5 per cent.

There are, however, other factors at work in the production of uniformity of climate than can be gauged by hygrometers installed at or near the ground level,

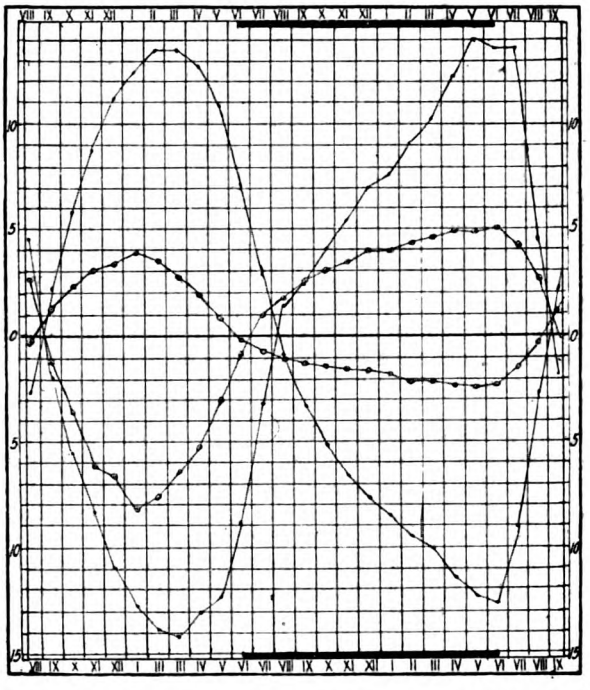


FIG. 3.—Graphic representation of the hot season in Jaipur, contrasted with the wet season in Rangoon. As in the last figure, temperature (Fahrenheit) and percentage humidity are plotted on the same scale. The lines with ringed nodes refer to Rangoon.

the principal of these being the amount of cloud which is determined by the hygrometric conditions not of the lower, but of the upper regions of the atmosphere which do not, by any means, necessarily correspond.

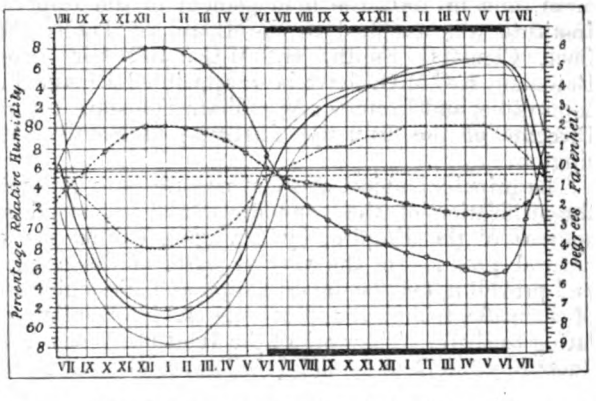


FIG. 4.—The above curves show the relation between temperature and relative humidity for a mean day calculated from hourly observation throughout the year. The heavy lines are the means of three years' observation at Mauritius, the dotted the same for Hong Kong. In each case the curves of temperature are indicated by the nodes being marked by small circles. The curves of temperature are plotted at 2° F. for each 1 per cent. relative humidity. The lighter lined curves are those of December and June for Mauritius for relative humidity.

The finely divided particles of water that form clouds and fogs are far less transparent and diathermic even than moist air; and the former not only greatly tempers the heat of the day, but also form a protective roof, which prevents loss of heat by radiation at night.

These differences are well shown in fig. 4, in which the diurnal changes for the means of the year are plotted for—the islands of Mauritius and Hong Kong respectively. An even more striking contrast might have been afforded by the extremely uniform climate of Batavia, but there the daily variation is so small that on the scale the diagrams are reproduced, the lines would be inconveniently near the mean lines for exact inspection. The mean humidities of the two islands, it will be seen, differ only by less than 1 per cent., and their mean temperatures sufficiently approach to each other for practical comparison. It will be thus seen that provided we are furnished with the maximum and minimum of temperature and humidity, and the average amount of cloud, we can form a very close estimate of the character of a climate and of its effect on the human system—apart from endemic diseases which usually depend on the quite different question of the geographical distribution of parasites, though these in their turn are necessarily much influenced by climatological conditions which thus, after all, are mainly responsible for the healthiness or sickliness of any given locality.

G. M. Giles.

THE IMPERIAL INSTITUTE.

The fourth number of the third volume of the "Bulletin" of the Imperial Institute, just issued, gives a short account of the present position and the work of what promises to be an eminently useful institution, when once it is in full working order. The Imperial Institute was founded as a national memorial of the Jubilee of Queen Victoria, and opened by Her Majesty in May, 1893. In 1900 the building became the property of the British Government, and in 1902 the management of the Imperial Institute was assigned to the Board of Trade. Sir Cecil Clementi Smith, G.C.M.G., and Sir Alfred Bateman, K.C.M.G., have been appointed a managing committee, and Professor Wyndham Dunstan, F.R.S., Director of the Imperial Institute at South Kensington.

The principal object of the Institute is to promote the utilisation of the commercial and industrial resources of the Empire, by arranging exhibitions of natural products of the various parts of the empire, and providing for the investigation and dissemination of scientific, technical and commercial information relating to them. The work of the Institute is now conducted by the Commercial Intelligence Branch of the Board of Trade, which is located at 73, Basinghall Street, London, E.C., and by the Emigrants' Information Office in Westminster.

Thirty-eight colonies and dependencies have their economic products arranged on a geographical system in the galleries of the Institute. A Bureau of Information has been opened to facilitate the supply of general information and the distribution of literature. A Scientific and Technical Department, consisting of well-appointed laboratories, deals with the investigation of the new or the imperfectly known products of the colonies and of India, with a view to their utilisation in commerce; and British Consuls are encouraged to transmit natural products of the countries to which they are appointed. In the Institute is an excellent library as well as reading rooms, and three specially appointed rooms termed colonial conference rooms. The Cowasjee Jehanghier Hall is used in common by the Institute, the India Office and the London University for lectures, meetings and conferences.

Nor does the work of the Imperial Institute end with these, for the British Women's Emigration Association and the Colonial Nursing Association (Room 5) have had offices portioned off for their use and occupation. The "Quarterly Bulletin of the Imperial Institute" is a valuable publication, and not only announces the work being carried on at the Institute, but supplies technical information concerning many of the less known natural products of the British Colonies and of India. In the volume just published we find reports on "Cotton from the Federated Malay States," "Fibre of Asclepices Semilunata from Uganda," "Lokesi" fibre from North-Western Rhodesia, "Black Damar Resin from Assam," and several other articles of high economic value.

The "Bulletin," price 1s., is obtainable at Messrs. Eyre and Spottiswoode's, Fleet Street; Messrs. G Street and Co., Cornhill; or at the Imperial Institute, South Kensington.

SIXTH INTERNATIONAL DERMATOLOGICAL CONGRESS, NEW YORK, SEPTEMBER, 1907.

President: Dr. James C. White, Boston, U.S.A.

To the Editor of the Journal of Tropical Medicine.

Dear Sir,—The Organising Committee of the Sixth International Dermatological Congress to be held in New York, September, 1907, has selected as one of its topics for discussion Tropical Diseases of the Skin. Can you, perhaps, suggest someone in Great Britain or your colonies to report on the subject from a dermatological standpoint?

Very truly yours,
John A. Fordyce, M.D.

80, West 40th Street, New York,
March 8th, 1906.

[Will those intending to take part in the discussions on Tropical Diseases of the Skin at New York, in September, kindly communicate with Dr. Fordyce direct?—Ed. *J. T. M.*]

Abstract.

CONDITIONS AFFECTING THE LOCATION OF MISSIONARIES OR THEIR RETURN AFTER FURLOUGH.[1]

By C. F. Harford, M.D.

Principal, Livingstone College, Leyton, London, E.

There are few questions more difficult to decide than those which relate to the influence of climate on the health of individuals. This is even the case with our own little island; and when we are called upon to

[1] Read before the Medical Officers of Missionary Societies, January, 1906.

advise those who may be called upon to take up work in distant regions of the world, the complexity of the problem is very largely increased from the fact that uniformity of climate does not exist throughout any large territory in any part of the world.

In the selection of suitable candidates for service in the mission field, although we may not all be agreed as to the exact points which should lead to disqualification, we are at one in requiring that candidates for foreign service should be physically sound.

It must be remembered, however, that the mission field is a wide one, and there are candidates who would be totally unfitted for work in some regions who might be able to do useful service in other parts, so that we need to use great discrimination in the selection of countries to which each Missionary may be permitted to go.

It will probably be best to adopt a geographical order, and to note the prominent characteristics of those countries to which Missionaries are most commonly sent, and in so doing we may select first the continent of Africa, which presents some of the greatest difficulties of climate, though parts of it may be included under the healthy regions of the world. It may be considered in five sections: (*a*) West Central Africa, including Senegal, and Niger and Congo basins; (*b*) East Central Africa, including Upper Nile districts and Zambesi basin; (*c*) highlands of Central Africa; (*d*) South Africa; (*e*) North Africa.

(*a*) *West Africa.* — West Africa has the unenviable reputation of being the most unhealthy part of the world, and by West Africa we mean the coast districts extending from the Senegal to the Congo, and including the country drained by these two rivers and the Niger. Probably the occurrence of very grave forms of malaria and the prevalence of blackwater fever account for much of the unhealthiness of the climate, but the houses are not, as a rule, carefully constructed, and often are built in close proximity to insanitary native huts; the food supply is in few instances well developed; there are no health resorts to which Europeans can readily go nearer than the Canary Islands, and there are little opportunities for exercise and recreation.

(*b*) The *East African* districts present very similar conditions to those found in West Africa, but the form of malaria is perhaps not quite so malignant, and there are better opportunities for obtaining change for recruiting health.

(*c*) *Highlands of Central Africa.*—Certain parts of Central Africa have proved to be much more healthy than the coast districts. This is the case in Uganda, where European Missionaries have been at work, and very few deaths from climatic diseases have taken place, and very few have been invalided home. In the high plateaux of eastern equatorial Africa even better health conditions are to be met with, and some of these appear to be quite suitable for European colonisation. The same sort of conditions are to be met with in the Shire Highlands in British Central Africa.

(*d*) The climate of South Africa is, in many ways, better than England, and in some parts would suit constitutions to whom the European winter is trying; malaria and bowel disorders occur in certain districts, but these may be largely prevented with care.

(*e*) *North Africa* possesses an ideal winter climate, but the summer months are exceedingly hot. If it is possible to take a holiday in a cooler region during the months of July to September, the climate may be suitable for many who could not work in a tropical climate.

Palestine and Syria.—What has been said about North Africa applies to a certain extent to these parts, but it should be remembered that malaria is very prevalent in Palestine at certain seasons of the year, and owing to defective sanitation in the chief cities, there is great risk of contamination of the water and food supply, and thus bowel disorders are frequent, and epidemics of cholera are not unknown.

Arabia, including Turkish Arabia, possesses a very hot climate, and in some seasons it is intensely hot, whilst here, again, sanitation is almost unknown.

Persia possesses a fairly temperate climate, and, apart from bowel disorders, there is very little climatic disease.

India.—The houses in India are more generally suited to the climate, whilst there is usually a good food supply, and good sanatoria can be found in the principal hill stations, which can be reached by a good railway system.

South India, with which we may include Bombay and the Central Provinces of India, is distinctly tropical; the east coast is more trying than the west, and there is more malaria in the east.

North India possesses a fairly temperate winter climate, and many Europeans pay visits to India during this season with very slight risks to health.

Apart from the definite hill stations, it is probably, true to say that the United Provinces possess the best climate. The Punjab, Sind and Rajputana probably rank next in point of view of healthiness, though the heat here is often most intense. Probably the most unhealthy is Bengal.

Burmah may be classed with Bengal on the point of view of climate, whilst the health conditions of Siam and the Straits Settlements may be compared with those of South India.

China possesses even a greater range of climate than India, but the sanitary conditions are bad, and there is, therefore, a tendency to bowel disorders. There is also a special strain on the nervous system in China; and Missionaries to China should have no tendency to mental or nervous disorder, either hereditary or acquired.

South China is distinctly malarious, and might be classed with Bengal. North China, on the other hand, has an intensely cold season, and is fairly free from any climatic diseases.

Japan.—The climate of Japan cannot be regarded as an unhealthy one, but there is one difficulty which must always be kept in view in selecting workers for Japan, viz., the great tendency to a curious form of headache, which is often spoken of as "Japan head."

America.—In the American continent our chief attention must be directed to the tropical regions which are to be found in Central America and to the north of South America. The health conditions in many parts are exceedingly unhealthy, and may be compared with East Africa, though the prevalence of

yellow fever must be taken into account, which does not occur in East Africa.

Tropical Islands.—Each of the important tropical islands has some special features of its own, and particularly with reference to the distribution of malaria. Naming the most important, we may mention Madagascar, Ceylon, East Indian Islands, and the West Indies. These are usually more healthy than similar regions on the continent.

Cold Climates.—There appears to be little climatic disease in cold regions, such as in the northern districts of North America, but there are great hardships to be endured, which require considerable powers of endurance.

The Return of Missionaries after Furlough.—There are many causes which may prevent the return of Missionaries to different parts of the field.

Individuals who suffer from persistent attacks of malignant malarial fever should be regarded as unsuitable for malarial climates. Repeated attacks of blackwater fever should be regarded as a disqualification, and one particularly severe attack may, however, be regarded as equivalent to several slight attacks.

Continued diarrhœa is one of the most serious conditions which affect the prospects of useful service in the Tropics, and unless a permanent and satisfactory cure can be obtained, there must be no thought of return to the mission field.

Persistent nerve troubles, such as sleeplessness, headache, or any tendency to mental weakness, are signs of danger which must not be disregarded, especially as they are likely to be accentuated by further residence in the Tropics.

Other cases will be found in which there appears to be some particular idiosyncrasy which renders the individual unsuitable for work in one country or location, and yet which might not debar him from work in another climate. A reference to some of the climatic conditions of the different countries may help in finding the most suitable location.

Review.

J. Courmont, of Lyons, on the "Atmosphere," and C. Lesieur, of Lyons, on "Climatology," in a Treatise on Hygiene, published by P. Brouardel and E. Mosney, T. 1., fascic. i., pp. 124. Paris, J. B. Baillière. 1906.

The characters of the atmosphere are studied from the standpoint of public health. Ten pages are devoted to its chemical and twenty-three to its physical properties; the characters of free and confined air being separately considered. Another ten pages are given to the question of inorganic dust and the methods of dealing with dust nuisances, after which living organic dust—the bacteriology of the air, in fact—is considered in the final thirteen pages. The variation according to season and altitude in these living forms of dust, the transmission of diseases through the agency of the air, and the natural means of purification by time, drying, and by the sun's light, are all briefly considered, so that the article is one which treats systematically of a subject which has hitherto been but scantily dealt with in text-books.

M. Leisieur's article on climatology is necessarily too brief to include more than a bare sketch of his subject, and so wisely devotes most attention to temperate European climates, but some notice of hot and cold climates is also included, and the last five pages are devoted to the question of adaptation to climate.

Correspondence.

THE REVIEW OF HUGGARD'S HANDBOOK OF CLIMATIC TREATMENT.

To the Editors of the JOURNAL OF TROPICAL MEDICINE.

SIRS,—Not until two or three days ago did I see your issue of February 15th, in which you courteously inserted my letter criticising your Reviewer's notice of my book. But by printers' errors in the placing and in the omitting of quotation marks, I am made to adopt the Reviewer's standpoint.

In these circumstances I beg permission once more, and finally, so far as I am concerned, to place the point at issue before your readers.

According to my exposition the comparative coldness of the upper layers of the atmosphere is mainly due to the physical laws of the expansion of gases, a body of doctrine as fundamental in modern meteorology as is the doctrine of gravitation in astronomy. But according to your Reviewer "this law explains only the rather exceptional case of uphill winds." An exactly equivalent criticism in astronomy would be that the law of gravitation explains only the fall of apples. To the Reviewer's mind the true reason of the comparative coldness of the upper layers of the atmosphere is "the universal operation of the law of selective absorption."

In reply to my criticism your Reviewer quotes the first two paragraphs from Hann's Exposition of the Causes of the Vertical Decrease of Temperature, in which Hann points out "that the storage of heat at the bottom of the atmosphere results from the peculiar behaviour of this atmosphere towards solar radiation. This process has been called *selective absorption.*"

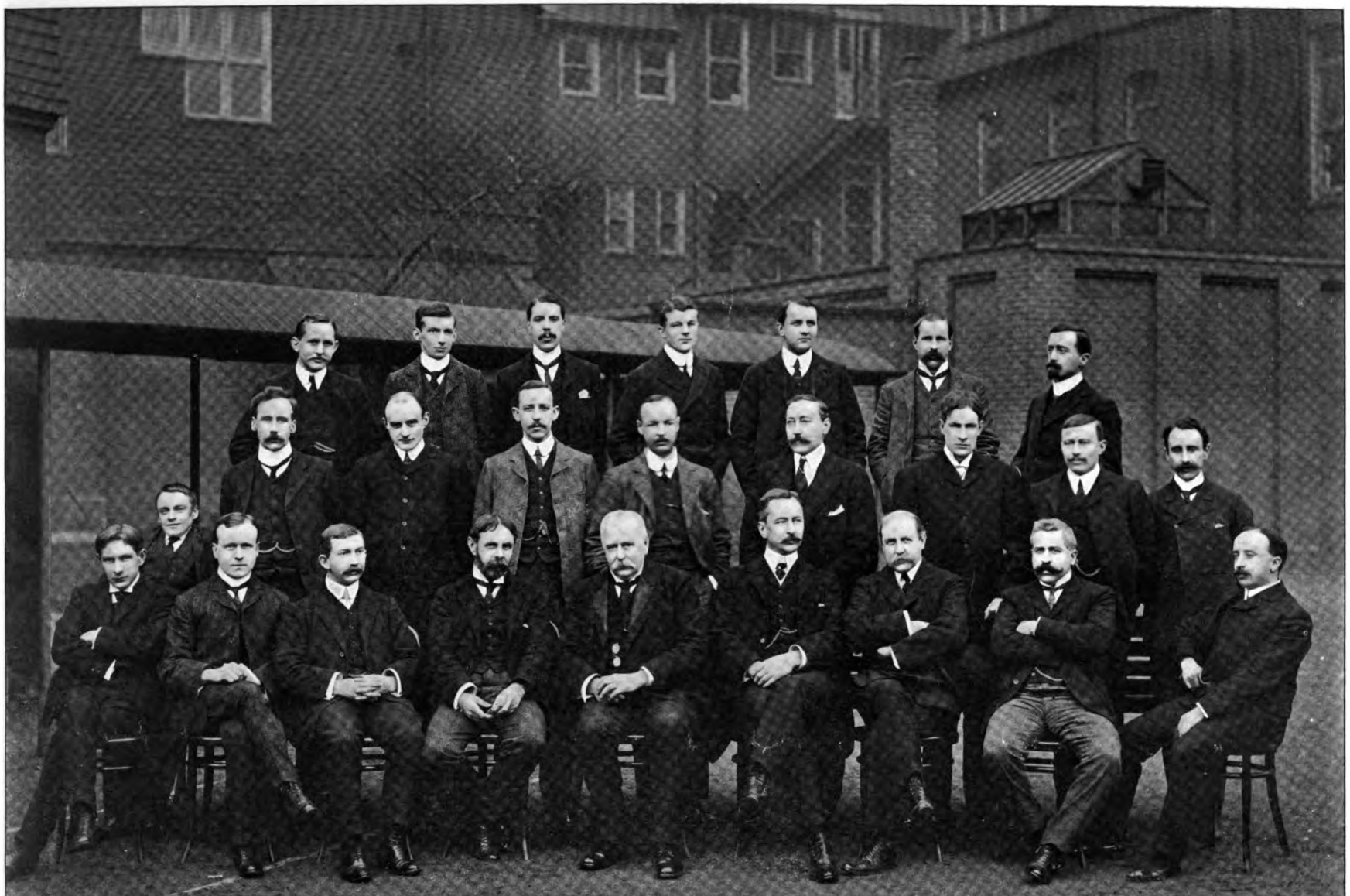
That the special storage of heat in the lower layers of the atmosphere accounts for the comparative coldness of the upper layers may be claimed by your Reviewer as a discovery of his own. At any rate this explanation does not appear to have struck Hann, who, a page or two after your Reviewer's quotation (*Handbuch der Klimatologie*, 2nd ed., 1897, vol. i., p. 264), continues as follows:—

"Therefore the general law holds good: Ascending masses of air cool at the rate of 1° C. for each 100 metres of elevation, so long as no condensation of water vapour takes place; conversely, descending masses of air become warm at the same rate.

"If we imagine the air masses of the atmosphere so thoroughly mixed in a vertical direction that every particle of air had several times passed through the whole height of the atmosphere, the fall of temperature would then be found to be 1° C. for each 100 metres of height. At this rate of decrease of temperature a rising or a falling mass of air would, at each level, encounter its own temperature, that is to say, it would in each level be in equilibrium, having no tendency to rise or to fall. This is the condition of indifferent (convective) equilibrium."

That the actual rate of cooling in the lower layers of the atmosphere is much less rapid than theory would lead us to expect is explained partly by selective absorption and partly by the heat set free through the condensation of moisture.

In his *Lehrbuch der Meteorologie*, 1901, p. 161, Hann says: "The more recent balloon journeys have shown in fact at heights over 6 to 8 kilometres a fall in temperature of 0·8-·9° C. per 100 metres; and this proves that at



3rd Row : W. Rogers, A. Reid, P. H. MacDonald, A. G. Eldred, G. B. Warren (Laboratory Assistant), H. E. Arbuckle, W. E. Ruttledge.

2nd Row : J. B. McVail (Jun. House Surgeon), J. M. Plews (Sen. House Surgeon), B. Moiser, Major F. Joslen, I.C.V.D., Major J. K. Close, I.M.S., J. R. Carter, G. J. Pirie, H. R. Pakenham.

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Absent—H. Kramer, G. P. Tayler, D. Paton, R. Borland.

LONDON SCHOOL OF TROPICAL MEDICINE.

20th Session. January-April, 1906.

Bale, Sons and Danielsson, London.

these heights vertical movements of the air must be very frequent, since they almost determine the temperature of these high layers.

Thanking you in advance.

I have the honour to be, Sirs,
Your obedient servant,
WILLIAM R. HUGGARD.

Davos-Platz, March 23rd, 1906.

[At the urgent request of Dr. Huggard we departed from the general rule of all publications, scientific or otherwise, that a reviewer's comments are privileged.

At first sight this rule might appear to be unfair to the reviewed, but it is obvious that but for its existence, either reviewing would fall to the level of uniform inane compliment, or much of the space of periodicals would be occupied with discussions interesting only to the combatants concerned. We therefore propose to adhere rigidly in the future to the wholesome general rule, and if any author is not prepared to accept our review of his work, for what it may be worth there is no need for him to forward it for review.

The present instance is a good case in point, as it has involved printing long extracts from a standard work accessible to everyone. Both reviewed and reviewer, of course, are perfectly aware of the rudimentary fact that gases get hot when compressed, and cool when they expand, but if this determined the temperature gradient for different elevations the fall of temperature in ascending would be much more rapid than it is, and the actual usual gradient is determined by the action of selective absorption. We have equally no doubt that Dr. Huggard thoroughly understands this, but he has failed to make it clear in the book reviewed, in which "selective absorption" is not even mentioned in the index. It is not enough, however, for an author to understand his subject, as he fails in his object unless he succeeds in making others do so. This discussion must now be closed.—ED. *J. T. M.*]

PLAGUE AND FLEAS.

THE Indian Plague Commission are said to have definitely proved that rat fleas are the normal vehicles of infection in animals, and probably in man. This has been arrived at by shewing that animals protected by fine wire gauze remain immune in plague-infected buildings, while unguarded controls contract the disease in large numbers. Although Ogata as far back as 1897 shewed that the titurated fleas of rats were infective, the theory of insect transmission has been generally "pooh-poohed," and much of the credit of bringing the matter again to the fore is undoubtedly due to Capt. Glen Liston, I.M.S., whose paper in the *Indian Medical Gazette*, of February, 1905, may certainly be considered the new starting point of the now triumphant theory.

Notes and News.

METEOROLOGICAL stations are to be instituted under the Indian Meteorological Department at Pharo and Gyantse in Tibet, and as these are our only present stations beyond the Himalayan watershed, the gain to meteorological science can hardly fail to be of the first importance, especially in connection with the supposed relationship between the snowfall of Central Asia and the intensity of the south-west monsoon.

MR. HUGH CLEMENTS' FORECAST FOR THE SOUTH-WEST MONSOON OF 1906.

Omitting a number of illustrations of the infallibility of his methods based on the weather in Bombay, we reproduce from the columns of our contemporary, the Allahabad *Pioneer*, the following letter on the forthcoming monsoon:—

"The south-west Indian monsoon is not a magnified land and sea breeze, as stated in all pseudo-scientific works, but is caused by the tidal action of the moon and the sun forming depressions to the north of India, towards which the air from the Indian Ocean is drawn by the great inequality in the barometric pressure.

"From the position of the moon and the sun at any moment I am enabled to localise the depressed area all over the world, and thus predict unsettled and wet weather. For each place there are certain lunar and solar celestial positions correlated with periods of depression and rainfall.

* * * *

"In accordance with my calculations of the height of the barometer and rainfall for each day, may I venture to predict that the south-west monsoon will break on May 16th, 1906, and continue off and on till August 13th? There will be some rain again after the first week in September and at the end of August.

"It will be windy round the British coasts on January 3rd, 11th, 22nd, and 29th, 1906.

"*A*. My prediction of mild and cold periods from November 21st has been amply verified.

"*B*. The *Daily News* of December 21st, 1905, contained my Christmas forecast, and proved accurate in every detail.

"HUGH CLEMENTS.

"Newton House, Burry Road,
"Dulwich, S.E.,
"*December 31st*, 1905."

The above extracts may be of interest to such of our readers as reside within the limits influenced by the south-west monsoon, especially as by the time this issue reaches India the performance of the monsoon of 1906 will be "just agoing to begin," and they will be able to compare the actual facts of Nature with the predictions of the prophet. The objections held by ordinary students of meteorological science to Mr. Clements' theories are sufficiently obvious, and are based on the facts that in the first place, although an atmospheric tide undoubtedly exists, the wave so produced is so feeble that it can only with difficulty be recognised in barometric records; and again, it is difficult to see how a series of phenomena regularly recurring every lunar month can account for a seasonal phenomena lasting some five or six of these periods. Oceanic tides can be foretold with a mathematical certainty which was recognised in proverbial folk-lore long before the facts had been reduced to tabular statement; but quite the reverse is the case with the south-west monsoon, which has hitherto defied the efforts of the scientific weather forcaster in a manner that has led the Indian public to regard his predictions with rather more amusement than confidence.

Of course, the official meteorologists would be the

first to admit the inadequacy of our present knowledge and means; but even if Mr. Clements chances to hit the mark on the present occasion, it would require several years of success to convince those who have most deeply studied the question to look upon a successful guess as other than a coincidence.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Journ. Roy. Met. Society," 1906, p. 21.

GENERAL FEATURES OF THE PRESSURE AND WIND CONDITIONS OVER THE TRADES-MONSOON AREA.

Dallas, W. L., epitomises the results of ten years observations from ships' logs, and land stations, recently collated by the Indian Meteorological Department, within an area of 32° N. to 12° S. and 40°-140° E.

These show that, taking the whole area, pressure is highest in January and lowest in July, while the wind is strongest in the latter month; but shows, unlike the pressure, not a single maximum in January, but double minima about March and October.

The apparent discrepancy is due to the undue preponderance of the northern latitudes, and the contrast in the distribution of sea and land of the belts north and south of the line. Even, however, if two 4° belts N. and S. of the equator be taken; the double oscillation, corresponding to the position of the vertical sun is very ill-defined, and moreover, in both zones, there occurs a minimum in April but there is none to correspond with it in October, nor do the pressure maxima occur at the solstices.

The pressure changes from month to month are much less symmetrical than might be expected. They are smallest at the two solstices, when the sun remains practically stationary over lat. 21° for two months, and largest between May to June and September to October, as a result of the large temperature changes then occurring over the large land surfaces of Southern Asia.

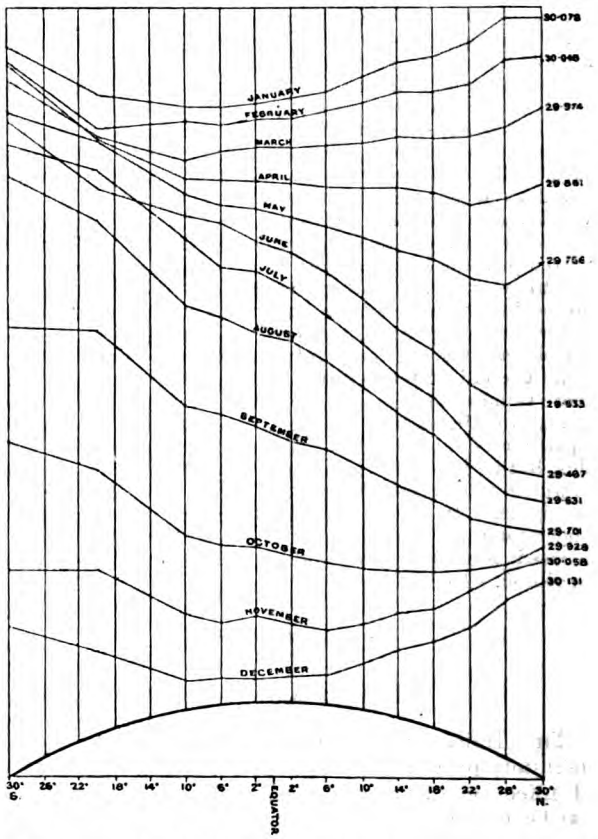
The distribution of pressure in each month in the included area is then discussed, but these are best studied in the appended graphic representation.

It will be observed that the pressure changes lag a great deal behind the sun. In spring and autumn the curves are saucer-shaped, the lowest pressures being between the equator and 10 S°., and as a result, the winds north of this area have a marked northerly component, and those south of it a southerly; but in April the distribution changes, and there comes into existence a steady decrease of pressure from lat. 30° S. to 22° N., while the high pressure area in 30° N. is very slight and unimportant. From May to August these changes are maintained and intensified, there being a steady gradient from 30° S. to 30° N., which is at its steepest in July, when it amounts to nearly three-quarters of an inch of mercury, but there is a smaller second maximum of a quarter of an inch in December, with interposed minima in February and November, when the range of gradient is no more than 1·7 inch. The calms of these latter months and the strong winds of February are easily understood by following the curves for each month.

The most important point in the paper, however, is that the author quite rejects the old theory that dominates many of the past official memoirs of the Indian Meteorological Department.

These were to the effect that the monsoon current is due to an impulse in one spot, like a jet of steam issuing from a closed reservoir. For example, in a *Memorandum*, written in 1891, these views are stated as follows:—

"Hence the advance or extension (or burst of the monsoon) takes place from South to North, and therefore cannot be explained as a mere indraught to a hot area. The phenomena rather indicates that there is a vast resistance to be overcome, and that when this is effected by a force from the rear, the massive current moves forward and invades India."



By means of a table showing the barometric gradients from zone to zone, and the mean wind force, the author shows that the observations discussed afford no evidence of any such "tempestuous obstacle overcoming onslaught," and that "a general agreement between the pressure differences and the mean force of the wind obtains throughout the whole area and throughout the whole monsoon period, and the velocity and strength of the winds of the circulation appears to be regulated by the ordinary rules of the differences of barometric gradient, and not, at any time, by a single impulse imported to the rear of the aerial current."

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4.—Authors desiring reprints of their communications to the JOURNAL OF TROPICAL MEDICINE should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communications.

NOTE ON THE TINEA IMBRICATA IN BRAZIL.

By Ulysses Paranhos, M.D.
Assistant in the Pasteur Institute; Physician to the Charity Hospital; and
Caramurie Paes Leme, M.D.
Director of the Laboratory of the Chemical Institute of São Paulo.

The first cases of Tinea imbricata recognised in Brazil were observed by one of us during a scientific excursion ordered by the Government of São Paulo in Brazil. The first case which, by its evident symptomatology, induced us to make the diagnosis of Tinea imbricata was observed in a native of the Carajas tribe inhabiting one of the islands of the River Araguaya in the State of Goyaz.

Among the Carajás Tinea imbricata is very common. They call it "roôro," which, in their language, means "the flying disease," because they think that hostile tribes blow it in the direction of their huts to cause them harm.

The natives of Brazil generally employ for the cure of this illness the bark of the root of *pinjossara*, which is no other than the plant called *Ocalia perdiceps* of Baill.

One of us was present at the moment of this application for the treatment of the Tinea imbricata among the indigenes, which, on account of its great originality, deserves to be mentioned.

The bark of the root of the *Ocalia perdiceps* is placed in maceration in cold water. On the following day the patient undergoes the application of this medicine, which consists in friction over the whole body with the macerated bark, after which the patient is exposed during half an hour to the action of the sun's rays, and washed afterwards in cold running water, his skin being then rubbed all over with the ashes of the same plant.

The consequences of this treatment are not long in appearing; the skin becomes reddish, being formerly of a bronze colour; the patient becomes agitated, the temperature rises, and sometimes delirium is observed, which often reaches frightful proportions. This state of things lasts from four to six hours. Sleep comes on, and on the following day the patient awakes quite calm, his general condition is good, and the appearance of his skin visibly modified, the large scales fall off, a slight glossy scaling being then observed.

On the third day after this application the same treatment is repeated, but then the reaction of the organism is weaker.

The treatment is thus continued every three days till the complete recovery of the patient. The reaction of the patient always preserves an inverse proportion to the number of applications.

The positive result of this native treatment, though empiric and excessively violent, is undeniable. The treatment of the native Curicy, the first patient whom we observed and a typical case of Tinea imbricata, proves it thoroughly.

Submitting himself to the indigenous treatment, he recovered in our presence from his illness, which did not repeat itself, as the man accompanied our scientific excursion as far as the State of Para, returning in our company to São Paulo without the least sign of reappearance of his dermatosis.

Tinea imbricata exists in Brazil, as we have observed personally, in the States of Goyaz, Matto Grosso, Minas Geraes, and São Paulo.

In the State of Goyaz it rages along the banks of the River Araguaya; in Minas Geraes it exists in the city of Uberaba and its neighbourhood, and in Matto Grosso among the natives on the left bank of the Araguaya.

In the State of São Paulo, where we have better observed it, Tinea imbricata is found on the banks of the River Pardo in Yardinopolis, Sarandy, Visconde, Coronel Orlando, and in the populous city of Batalaes.

Tinea imbricata in Brazil attacks every race. We had opportunities of observing it in individuals of the yellow race, in natives, among the white people, and negroes. Age and sex have no influence whatever upon it. Among our observations cases occurred at the ages between 12 and 50, and the prevalence in either sex is not remarkable.

Social position presents no difference in liability; we have observed the disease in individuals belonging to the lowest class of society, but, on the other hand, we have also seen patients who belonged to the highest ranks, living with all comfort and having the best hygienic conditions.

The disease in Brazil presents itself in the classical manner so accurately described by Sir Patrick Manson in his valuable works on the subject. The disposition of the scales of the skin as a collar, their position resembling that of the tiles on a roof, is quite accurate.

On examining our patients we have always found the parasite described by Tribondeau. For the recognition of the parasite the following process may be employed.

The scales of Tinea imbricata are treated by alcohol at 40° for five minutes, and afterwards with sulphuric ether in a test tube, which should be shaken several times. After having washed the scales with sulphuric ether, treat them with a solution of potasium in distilled water in the proportion of 10 per cent., keeping them in that solution until they are disintegrated.

The scales are then washed several times with distilled water, being left in that liquid for some time to entirely free them from the excess of potassium.

After this nothing more is needed except to spread the scale on a slide, which, under the microscope, presents the *leptophyton* much more transparent and hyaline than the cellular elements. The scale being separated by the process we have described, and the preparation being fixed *a calore*, we can stain it.

The colouring substances employed are any of the aniline stains.

After having coloured the preparation, we wash it with alcohol and distilled water, examining it immediately with the microscope. One of us, in the researches made in the Pasteur Institute of São Paulo, obtained good results with the method of double colouring advised by Jeanselme. Having fixed the

scales of the Tinea imbricata by ethylic alcohol and crystallisable acetic acid, the preparation being free from all greasy substance, is plunged for twenty seconds in a solution of 1 in 100 of eosine orange, and afterwards discoloured by means of a few drops of alcohol at 60° ; the preparation is then plunged for one minute in an aqueous solution of toluidin blue of 1 in 100 and discoloured once more by means of alcohol till the scale gets a clear colouring, after which the preparation is clarified by means of xylol and examined microscopically.

On the specimens coloured by the Jeanselme process one can see the mycelium filaments of the parasites clearly stained in dark blue on the *epidermic* cellular elements, coloured yellowish-red.

Superior to the method of Jeanselme, just described, is the following, mentioned by one of us in the JOURNAL OF TROPICAL MEDICINE, of December, 1905.

This method consists in washing the suspected scale in winter-green essence and Roux mixture; in its disassociation in an ammoniacal solution of 30 per cent., and its colouring by means of lithined aniline blue prepared by a special process. The preparations obtained by this method have a rare precision and show the presence of the parasites, even if these are in minute numbers. They are superior to the methods of colouring in toluidin blue (Jeanselme), or eosined alcohol (Besson), or vesuvine (Trebondeau) and safranine (F. Noe).

In our researches we have always observed, as already stated, the parasite of Trebondeau. The constituent elements are ramified and in great number; each one of them is formed of cubic or rectangular articulations of various sizes. Where the ramifications can be descried the *mycelium* elements present a single body resembling the letter T or Y.

We have investigated with the greatest care to ascertain the starting point of the Tinea imbricata in Brazil, but, unfortunately, all our researches have been failures. It is a current opinion among people inhabiting the infested localities that the Tinea imbricata is derived from water, and shows itself in persons who bathe in the rivers. All that is but a supposition ; it is, however, convenient to observe that the disease has its principal centres in villages situated on the banks of rivers.

One of us has devoted himself to investigations so as to know how far the popular idea regarding the diffusing of the Tinea imbricata through river bathing is true, but nothing has been proved up to the present respecting the subject.

Tinea imbricata is, in our opinion, increasing in Brazil. The fact of its being unknown up to a short time ago denotes it was rare in past periods. It used to attack only the natives, or persons inhabiting those places where physicians were not to be found who were acquainted with tropical dermatology, and who did not make the true diagnosis of the illness. Actually it is quite different, because the disease exists in the populous centres where its greater diffusion is readily understood.

We have tried, on our patients suffering from Tinea imbricata, most of the forms of treatment advised.

We have obtained good results by the application of wet boric compresses, followed by friction with black soap and the use of Goa powder, advised by Branel.

The application of an iodine liniment recommended by Patrick Manson has benefited some patients ; but what has given the best results, in our cases, is the bark of *Ocalia Perdiceps* adopted in the indigenous method.

The general lines of our method are: (1) A general tepid bath with an alkaline solution of one kilogramme of sodium acid carbonate diluted in twenty litres of water. (2) A lotion with the following mixture: Bark of *Ocalia perdiceps*, 50 grammes; glacial acetic acid, 15 grammes; glycerinated water (10 per cent.), 985 grammes; let the whole macerate during two days and then filter. We employ, before making use of this medicine, an alkaline solution to soften the scales and thus facilitate the introduction of the parasiticide medicine to the cellular elements. During this treatment we recommend to the patient a liberal regimen. We add also to this, tonic remedies such as iron, arsenic and strychnine. With this treatment the results obtained are quite encouraging.

MOSQUITO NOTES.

By Lieut.-Colonel G. M. GILES, I.M.S. (Rtd.).

I.—NOTE ON A SMALL COLLECTION OF MOSQUITOES FROM BARHAIN IN NORTHERN ARABIA (SHORES OF PERSIAN GULF).

IT is a curious coincidence that an incidental remark on the scantiness of our knowledge of the mosquitoes of the Arabian peninsula in our last issue had hardly gone to the press, when I received from Dr. A. Bennett one of my collecting boxes with a small collection of mosquitoes from the Island of Barhain.

Unfortunately, too many specimens had been crowded into the box, so that some have suffered a good deal in transit, and it is possible that it may include more species than those enumerated below.

It includes only one specimen of the Anophelinæ, a female *Nyssorhynchus metaboles* (Theobald), rather darker than most of the specimens in the British Museum collection, but this is probably the result of rubbing.

There are a number of specimens of a Mansonia, which represent, I fear, a new species.

Of the ten specimens, eight are males and two females.

Mansonia Arabica, sp. n.—Wings unspotted, but brindled ; clothed with large broad scales, many having the characteristic "bracket" form ; these are mingled white and black, the former largely preponderating; fringe scales entirely white.

Thorax dark brown grounded, clothed with white ferruginous and almost black curved scales, which very probably produce a definite ornamentation which appears to reproduce the two pale stripes of *Mansonia dorsalis* (Meig.).

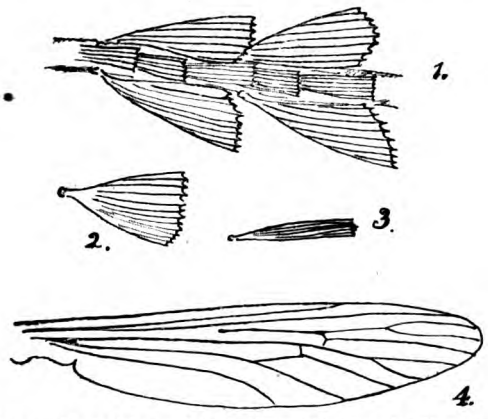
Abdomen generally pale, clothed with a mixture of white, with a few ferruginous scales, the former form-

ing an almost pure white median line, while the latter are mainly confined to the sides. In addition, there are on all but the last segments a pair of L-shaped dark brown spots, the horizontal limbs of which form an apical dark border to the segments, interrupted by the median white line.

Legs brindled, with black, white, and ferruginous scales, giving a generally rather dark effect, with snowy knee spots, and three fairly broad, articular, ferruginous bands on the tarsi (rather variable).

Proboscis dark at the tip and absolute base, and quite pale in the middle, but still not definitely banded.

Head mainly covered with white, forked scales. Antennæ of ♂ ferruginous, of ♀ with almost white plumes. Palpi of ♂ almost white, with darker spots



Mansonia arabica. (1) Portion of 1st longitudinal vein. (2) A broad scale from one of the hinder veins. (3) Lateral scale from anterior fork. (4) Venation.

at the joints and in middle of the long second joint; of ♀, dark brown. Scutellum with white and ferruginous scales; pleura ferruginous, with some white tufts; venter mainly white scaled; sides of abdomen densely fringed with long brown hairs. A fairly large mosquito.

The female has a median, ferruginous abdominal stripe, and the L-shaped spots so large as to be almost continuous laterally, and in both the marking is generally darker than in the male.

In Mr. Theobald's classification I conclude that this species would be placed as a *Grabhamia*, as it is strikingly like our English species *dorsalis*, which is included by Mr. Theobald in that genus. In the ♀ the resemblance is specially close. I confess, however, that I am unable to distinguish the limitations of *Grabhamia*, as the distinction between it and his *Tæniorrhynchus* on the one hand, and *Mansonia* on the other, do not appear to be quite apparent.

The genus *Mansonia*, if not too rigidly defined, is quite a natural one; and as regards the wing, the definition I should prefer would be that the veins should be prominently, but not necessarily, entirely clothed with large broad scales. This would admit of the inclusion of a considerable number of species, such as *fasciolatus*, which Mr. Theobald places in *Tæniorrhynchus*. The asymmetry of the so-called bracket scales is in most cases more apparent than real, and is more commonly an effect of perspective. It is erroneous, too, to assert that in any *Mansonia* there are no median scales, as stated in Mr. Theobald's definition of his genus. Unrubbed specimens must, of course, be selected, but what is actually the case is that in the more typical species the median as well as the lateral scales have assumed the peculiar broad form.

In the present species this is only commencing, though when separate and flattened out, the median scales are considerably wider than they appear in the *camera lucida* outline of the figure. Another character of the genus is that the species are brindled, with mixed scales of contrasting colours, not only on the wings, but more or less over the entire body, and especially on the legs.

A somewhat striking character of the venation of the present species is the exceptional shortness of both the fork-cells.

The two remaining species included in the collection are almost cosmopolitan, for the warmer parts of the world, being:—

(2) *Stegomyia fasciata*, Fabr. Ten specimens, all but two of which are females.

(3) *Culex fatigans*, Wied. Twelve specimens, eight of which are females and four males.

II.—Dr. Adolf Eysell kindly sends me a reprint of the forty-ninth report of the Natural History Clubs of Cassell, entitled, "Sind die, Culiciden eine Familie?" (Are the *Culicidæ* a Single Family?). He first takes up the consideration of the genera *Corethra* and *Mochloryx*, which are now usually placed as a subfamily (the *Corethrinæ*) of the *Culicidiæ*, and gives excellent reasons for deprecating their inclusion with the true gnats, with which probably most naturalists who have studied these insects will agree. It may be remarked that it was only after considerable hesitation that I decided to include descriptions of these insects in my "Handbook of the Gnats or Mosquitoes," and I believe that Mr. Theobald felt a similar hesitation when preparing his monograph.

Our ultimate decision to do so I personally regard as a mistake, which unnecessarily extended the scope of our books. These insects, in fact, are not gnats at all, their mouth-parts differing entirely from the piercing apparatus of those insects, and should really be considered midges with a wing venation that chances to resemble that of the *Culicidæ*.

Possibly this is a case of mimicry, though, as is often the case, it is difficult to see what advantage accrues to the midge from its resemblance to the gnats. His proposal, however, to promote the *Corethrinæ* into a distinct family, instead of transferring them to the *Chironanidæ*, may not, however, command such general approval, and still more his proposal to adopt the same course with regard to the *Anophelinæ*, for if, apart from the *Anophelinæ*, the *Culicidæ* are not a single family, and, it may be added, a remarkably natural one, it is difficult to understand what constitutes family resemblance.

It is perhaps only a natural evolution of the process which is rapidly reducing our conception of genus to the level of species, and each naturalist's decision must depend on his conception of the limits of these extremely elastic and ill-defined terms. It is obvious, however, that it only requires a sufficient extension of

the process to leave each species in a separate class of animated Nature by itself, and then I suppose we should have to start off again with the process of sorting it by instituting generoids, familoids, or some such nomenclature.

He has also been good enough to send me a reprint of his articles on the mosquitoes in Dr. C. Mense's "Handbuch der Tropenkrankheiten," which gives in comparatively short compass a thoroughly up-to-date epitome of the morphology of the family, methods of dissection, collection, preservation, general principles of classification, &c., as well as a short account of the life-history of the malarial parasite. It is well and liberally illustrated, though some of the photographs are not quite as convincing as might be desired, and certainly in some cases might advantageously be replaced by drawings.

"Centralblatt für Bakteriologie Parasitenkunde und Infectionskrankheiten," xxxix., p. 280.

SCHISTOSOMUM JAPONICUM.

Looss shows that *Schistosomum Cattoi*, Catto, 1905, is only a synonym for *S. Japonicum*, Katsurada (1904); the employment of the newer name (*S. Cattoi*) should therefore be dropped, and the older be always employed in speaking of this parasite.

"Journal of Infect. Dis.," 1905, p. 577.

It is well known that plague bacilli are occasionally met with enclosed in a capsule, and W. B. Wherry has met with the same peculiarity in a cocco-bacillus isolated from the liver of a plague rat. The oval capsule stained red with Romanowski; and cultivations answered to all the ordinary tests of *B. pestis*.

"Archives de Zoologic. Exper.," 1905, p. 101.

RESEARCHES ON THE HAPLOSPORIDIÆ.

Caullery, M., and Mesnil, F. The haplosporids are an order instituted by the authors in 1899. They are sporozoa allied to the microsporidia, but with quite different spores. These are always mononuclear, with large, easily demonstrated nuclei, and the cell plasma quite undifferentiated, and with no trace of polar capsule.

The authors have combined their own work with that of others on simlar types, and propose the following classifications.

They divide the order into three families:—

(1) *Haplosporidiidæ*. Spores with double envelopes, the inner denser and furnished with an opening, closed by a valve in *Haplosporidium*, or open in *Urosporidium*, in which it also has a long tail-like process and a lateral wing. Parasitic in annelids.

(2) *Bertramiidæ*. Spore envelopes without opening. Genus *Bertramia* and probably *Ichthyosporidium*, one of the species of which inhabits the stomachs, and the other causes large tumours in certain fishes, but is as yet insufficiently known to be definitely placed.

(3) *Cœlosporidiidæ*, in which the entire parasite encloses in a dense membrane, while the mononuclear spores developed within it remain nude. It includes, besides the type genus, *Polagcaryum*, Sternbell, and *Blastulidium*, Perez.

The authors enumerate many other genera which they believe come within the order, and believe that the *Haplosporidiæ* are nearest to the *Sarcosporidiæ*, but approach also the *Microsporids* and *Rhizopods*, and perhaps to the lower fungi, such as the *Chytridineæ*. The human parasite recently described in a nasal polypus by Minchin and Fantham, it will be noted, is a *Haplosporid*.

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THE

Journal of Tropical Medicine

MAY 1, 1906.

IS MALARIA AS BLACK AS IT IS PAINTED?

THERE is an old tale, anent one of the old Georgian medical worthies—Abernethy, if memory serves us aright—that when posed by any difficult complication, he was accustomed to declare that "it was all gout." Nor, if we may judge from the writings of Haig and his school, is the doctrine by any means dead; for, indeed, the tendency of specialists generally to claim all disease as their own is proverbial.

For tropical countries malaria has, in this respect, always taken the place occupied by gout in temperate climates. Long before Laveran discovered the malaria parasite, the verdict of the tropical physician has generally been "it is all malaria," and the prominence that disease has recently attained as the pioneer of our knowledge of human protozoal disease has only added to its pre-eminence in this respect.

We have always been familiar with such terms as malarial rheumatism, malarial iritis, phlebitis, and what not, but it is tolerably certain that had these cases presented themselves to a European physician, suffering from what may be called the gouty bias, his diagnosis would have differed from that of his tropical colleague only in the substitution of the word "gouty" for "malarial."

Analysing the reports of such cases, we generally find that, beyond coincidence, the evidence in favour of the need of any qualifying word to that specifying the disease is remarkably scanty.

The maladies so described are usually of a sort that are rarely fatal, and even in cases that prove so, no evidence whatever is adduced to show that the malarial parasite is in any way responsible for the lesions recorded.

Take the case of "malarial" rheumatism: to the uninitiated they would appear mere ordinary cases of lumbago, sciatica, pleurodynia, and so on, such as are met with in all parts of the world.

The etiology, almost universally accepted elsewhere, is that they are due to the sudden chilling of the affected part, which brings about a congestion of the little sensory nerve bulbs that are scattered between the fibres of muscles, and especially amongst those of their tendinous insertions.

The reduction of temperature which thus irritates these very delicate structures is usually sharp, but of short duration, and leaves no visible impression on the surrounding structures, and as there has been no general chill, the patient, apart from his muscular pains, is little the worse, and shows no constitutional symptoms whatever. If resident in a hot country, he, doubtless, has suffered more or less from malaria, and may be debilitated from the strain of prolonged residence in a tropical climate, and these drawbacks may, no doubt, render him less capable of withstanding chills and other accidents, but this does not give us the right to regard his symptoms as a special and distinct variety of the disease from which he is suffering, still less to reduce the latter to the position of a mere symptom, indicative of malarial poisoning. Are we really to suppose that because a case of muscular rheumatism, occurring in a hot climate, may happen to have had one or more "touches of fever," his system is so "saturated with malaria" that the capillaries supplying the end bulb of the afferent nerves from his muscles are choked with parasites, or what are we to believe? Muscular rheumatism is very common in hot countries, because they have just the climates which most expose people to sudden chills. What need, then, is there of dragging malaria into the question?

Direct and obvious complications and sequelæ of really severe malarial infection belong to quite a different category, and are not the class of case we are considering. It is the subtle workings of "latent malaria" with which we are now concerned.

Another and more significant question, the importance of which is steadily forcing itself upon our attention is: How much of what we have been accustomed, clinically, to regard as malaria, is really of that nature?

For many years after Laveran made his great discovery our instruments and methods were so defective that but few succeeded in convincing themselves of its validity, and even after we had reached the stage of conviction, born of seeing undoubted parasites in fortunate preparations, our successes were usually so few, in proportion to our failures, that no one dreamed of regarding a negative result as in any way conclusive of the absence of malaria.

Fresh blood in a tropical climate is one of the most unstable of tissues, and with the utmost care to secure uniformity of method, two films from the same droplet of blood often present *post-mortem* changes of so different a description as to render any comparison obviously untenable. Under such circumstances what was to be read as an abnormality due to the presence of parasites, and what a fallacy due to *post-mortem* changes?

At this time malaria was, for us, like the first French Republic, "one and indivisible," and the puzzle was made all the worse by our meeting consecutively with different species of the parasite.

For these various reasons, the profession, even when convinced of the truth of Laveran's discovery, was, for purposes of diagnosis, generally driven back on the "clinical method." If one found parasites, well and good, the case was undoubtedly malarial; if not, it might, or might not be so, but few would reject the diagnosis on the strength of mere failure to find parasites.

With improvement in the methods of making and staining blood films, the physical diagnosis of malaria has become a comparatively easy matter, but there is still considerable reluctance to rely on the absence of parasites for a negative diagnosis, even after repeated examinations.

As recently as 1904, Powell, of Bombay, in the *Indian Medical Gazette*, 1904, p. 41, reporting on the examination of 3,413 cases of fever, found parasites present in 2,542 cases, and adds that, "of the remaining 761 cases, a definite diagnosis by clinical methods was made in 531, leaving 214 cases of fever whose cause is uncertain." Here, then, are at least this number of cases of indeterminate fever, which only a few years ago would undoubtedly have been ascribed to malaria; but what of the 531 cases diagnosed by "clinical methods," and what real ground is there for assuming them to be malaria at all?

Nothing more than that the general symptoms corresponded with one or other type of the very large group of feverish cases, which we were accustomed to diagnose as malarial in the days before we had any physical means of discrimination to rely on.

Added to this, it is now well established that, especially in children, malarial parasites may be present in the peripheral circulation, without producing any rise of temperature or other overt symptoms of ague; so that it does not absolutely follow that a fever is entirely, or even mainly, due to malaria because the parasites of that disease can be demonstrated in the blood. Everyone of any extended tropical experience well knows that malaria often shows itself as an awkward complication of any condition, whether morbid or traumatic, that throws a severe strain on the organism. This is notably the case in some epidemics of pneumonia on the very malarious Punjab frontier, where the coincidence of the two infections may be so general as to be almost the rule. That the added weight of the malarial recrudesence is far from improving the patient's chances goes without saying, but still, one does not regard the case as other than one of pneumonia, nor would it be fair to do so; and yet one might easily conceive the advancement of the thesis that the epidemic was one of "malarial" pneumonia, and not merely of pneumonia with more or less common malarial complication.

Another point that presents itself is the comparative rarity of serious cases of malaria in ordinary

tropical practice. Far more than nine-tenths of those met with are what are commonly spoken of as "touches of fever," lasting from a day to a week, or even more. Most of these are undoubtedly malarial, the parasites, usually of the "æstivo-autumnal" type, presenting themselves at the correct period, and disappearing coincidently with recovery. They are, moreover, mostly fairly amenable to quinine. Every now and again, however, a severe prolonged case of fever presents itself, in which quinine has no effect whatever. In the early stage, before the patient has been saturated with quinine, parasites may have been recognised in the blood, or they may not, and the case is diagnosed as malaria "by clinical methods"; but apart from customary habits of thought, what better ground is there for regarding the prolonged pyrexia as due to malaria, than in the case of pneumonia, with malarial complication.

So obvious is the fact that the vast majority of cases of malaria are of a very trifling character, that in the days before agglutination tests released us from so many perplexities, the diagnosis of malaria in the case of serious illness in a European was officially regarded in India with considerable suspicion, and it was considered as almost axiomatic that such cases must be referable to typhoid fever.

The mildness of the majority of attacks is equally proverbial in Africa, and the question naturally arises whether the serious fevers, occasionally epidemic in India, and the even more serious, but usually quite different, blackwater, and fulminating hyperpyrexia of Africa, have really any causation in common with the mild disease with which we are so familiar.

It is most significant that the severe fevers of India are usually quite different from the serious African fevers, for though hæmoglobinuria is occasionally met with in the former country, such cases, apart from this symptom, are far from otherwise presenting the clinical picture of blackwater fever.

It is notorious that malarial parasites are often conspicuous by their absence in that disease, and it must be repeated that their occasional association with the conditions above indicated definitely proves nothing more than complication; for if the discovery of parasites be equivalent to proof of malarial causation, then amputation of the leg and child-birth must often own a similar etiology.

Gradually, too, the origin of some of these indeterminate fevers is being elucidated. The final demonstration of the presence of Malta fever in India, noticed in a recent issue, accounts for a certain percentage of the serious cases that for want of a better diagnosis were mistaken for obstinately recurrent malaria. It is noteworthy that Bentley, of Assam, in the *Indian Medical Gazette*, 1902, p. 337, advanced the theory that kala-azar is really Malta fever, and his opinion was confirmed by Major D. Semple, of the Kassauli Pasteur Institute, by means of the agglutination test.

"Kala-azar" is always the malady that happens, for the time, to be in fashion, the native words really referring to any serious chronic malady, but it is clear that some of the cases, so-called, must be Malta fever, though the Leishman-Donovan parasite is now more in vogue, and doubtless does really account for a considerable number of the heterogeneous collection of cases brought on for treatment as kala-azar. Not so long ago the very investigators who are now most eager to make Leishman-Donovan parasitism and kala-azar synonymous were equally insistent of the theory that it was uniformly malarious in its etiology. A considerable percentage of cases, so-called by the natives, undoubtedly are chronic malaria, but more undoubtedly are referable to a variety of other chronic tropical maladies.

In view of the fact that malaria has already been deprived of kala-azar, will it be at all surprising should blackwater fever, and many of the other serious conditions now thought to be malarial, share the same fate?

Again, scarcely a month passes without our meeting with notices of protozoal parasites which are not malarial in the strict sense of the term. For example, W. Leonard Braddon, in the *Indian Medical Gazette*, 1903, pp. 168, 213, 291, describes a "mycoid body found in the red corpuscles in a form of remittent fever, prevalent in the Malay States" (*vide* also the JOURNAL OF TROPICAL MEDICINE, November 15th, 1901). Again, Jennings, in conjunction with Prof. A. Lingard, describes in the *Indian Medical Gazette*, May, 1904, a form of fever associated with a parasite they believed to be a piroplasma, and which was prevalent at a season when Anopheletes are practically absent.

Jennings' human hæmatozoa may or may not be piroplasma, as Lingard's conclusions in particular appear to be doubtfully received by the majority of protozoologists, but there is no practical doubt of the actuality of the parasites observed by Major Jennings, or of the validity of his general arguments as to their non-malarial nature, for these cases of cold weather and dry season fever, associated with the colourless, non-pigmented parasites, have long been a puzzle to many Indian observers, though they have, of course, been generally regarded as representing some phase of the malarial organism.

It would be easy to prolong this list, but the object of this article is not to produce a bibliography of the subject, but to suggest a judicial frame of mind in our consideration of the numerous cases, slight and serious, in which, though no parasites are evident, or in which, if present, do not correspond with any accepted stage of the known species of malarial hæmatozoa, but in which we have hitherto been too ready to take refuge in the time-honoured old diagnosis of "it is all malaria."

The question is by no means purely academical, as it is well known that many of this class of fevers are rather harmed than benefited by quinine, and it is very desirable that we should be able to save the patient a needless course of the drug, by reaching some means of arriving at an early and definite diagnosis.

THE *INDIAN MEDICAL GAZETTE* ON "GROWSING."

THE current (April) number of the *Indian Medical Gazette* pays us the compliment of printing *in extenso* our leading article on some of the causes of dissatisfaction in the Indian Medical Service, which appeared in our issue of February 1st.

That the editor of our contemporary agrees to differ from us is only what might be expected, as the *Gazette* is a good deal more than less an official publication, which no officer on the active list would dream of using as a means of ventilating his grievances, and hence is in a bad position to know what are the genuine sentiments of the rank and file of the service whose lot is cast up country, far away from Calcutta and the knot of men who, whether by luck or good management, occupy still desirable appointments in the second city of the Empire. The editor does not understand how the figure of thirteen men passed over for promotion on account of age was arrived at, and probably his information as to the age of officers qualified for promotion by their position on the list is more exact and up to date than ours, but for the purposes of our argument it matters nothing whether the accurate figures be 13 or 15 or 9. He admits that four men who were regarded as "in the running" were so passed over.

The gist of our complaint is that the Indian Government has hitherto given but scant encouragement to original research, and that the present rules as to superannuation bear hardly on men who have worked hard to specially qualify themselves for the service by taking house surgeoncies, honours examinations, and other post-graduate work.

With the above exception no attempt whatever is made to traverse the facts on which the complaints are based, though a lamely apologetic attempt is made to palliate them. Meanwhile, it remains an undoubted fact that no man who devotes really adequate time to his student career can reasonably expect promotion. As to the proposed remedies, opinions, of course, differ, as those who have been shrewd enough to enter young on a minimum qualification are naturally in favour of the existing state of things, but on the general indictment the writer of the *Gazette's* editorial is, so far, alone.

His contemptuous reference to officers who prefer to remain in military employ, whose fate, he says, is like to be "professional deterioration and finally, perhaps, supersession," appears to us to be, to say the least, in very doubtful taste, and will certainly not be relished by the very large section of the service so employed. He appears to forget that some one must perform the duties he so deeply despises, and that causes far other than laziness may determine an officer's preference for that branch of the service. As a matter of fact, however, a very fair share of promotion very properly falls to men on the military side, and though far from being enthusiastic admirers of the Indian Government's methods of dealing with its medical officers, we see no reasons for imputing to it the cynical injustice, implied in the editorial comment of our contemporary, of treating its military surgeons as an inferior and almost reprehensible body of men. He takes us to task also for failing to notice the hard case of the Sanitary Department, but all in good time. Pressure of space has prevented our returning to the subject during the last few issues, but we hope shortly to draw attention to a few other curled petals in the rose-bed of the Indian Medical Service.

ANÆMIA IN PORTO RICO.

A Commission, consisting of Drs. Jgaravidez, King, and Bashford, has been engaged in the investigation of Porto Rican anæmia since March, 1904. The Commission has issued a preliminary report of the work accomplished from June 1st to November, 1905. In all, 18,865 patients were treated by consecutive doses (usually 5) of thymol, or beta-naphthol, for the expulsion of the *Ankylostomum duodenale* (uncinaria), with the result that the large majority were cured. The Commission finds that 99 per cent. of cases of uncinariasis contracted the disease by way of the skin; ground itch on the feet and ankle being the indication that infection has taken place. The prophylaxis of the disease is to be secured by making the wearing of shoes compulsory; by insisting upon all infected persons using a latrine; and by, if possible, causing all workers on the soil to wash their hands and clean their nails before eating. It is satisfactory to know that the Commission is to be continued, and that the good work already done may be hoped to be amplified and extended.

MALTA FEVER IN SHANGHAI.

By Arthur Stanley, M.D., B.S.Lond., D.P.H.
Health Officer of Shanghai.

In view of the Editorial in the Journal of Tropical Medicine of December 15th, 1905, which tends to show that Malta fever is rare elsewhere than in Malta, the following laboratory notes may serve a useful purpose: During 1904 nine specimens of blood from suspected cases of Malta fever were examined, and seven of these gave the Widal reaction with the Malta fever organism. During 1905, of twenty-seven specimens from suspected cases of Malta fever, ten gave the Malta fever reaction. The Malta fever organism used in the laboratory was obtained originally from the Lister Institute, and the dilution of the blood used for the test was never less than 1 in 50. The blood was furnished from cases in Shanghai and from the Yangtse ports. Clinically the cases were reported as corresponding to Malta fever. It is proposed to examine the specimens of blood giving negative results with the typhoid bacillus for the Malta fever reaction, as the type of cases reported as typhoid fever in Shanghai are so mild (case fatality 10·2), and show such a tendency to relapse as to suggest the possibility of some of the cases returned as typhoid fever being Malta fever.

[In consequence of the great pressure on our space, we have been compelled to omit the Colonial Reports from the present issue.—Ed. *J.T.M.*]

RHINO-PHARYNGEAL LESIONS IN YAWS.

To the Editors of the Journal of Tropical Medicine.

Sirs,—The excellent paper in your Journal of February 15th, 1906, from the pen of Dr. James Farquharson Leys, deals with a disease which was brought to the notice of the profession in my treatise on yaws, published in 1891. I was then of the opinion that the rhino-pharyngeal

lesions, which I described, were later manifestations of yaws, and, though I could not trace the connection between this disease and the symptoms so described with scientific conclusiveness, I remember that there was at the time no doubt in my mind of the relationship which I assigned to them, any more than there would have been as regards syphilis and similar manifestations of the latter affection.

Dr. Nicholls, in his "Report on Yaws in the West Indies," 1894, attributed these symptoms to tuberculosis, which, he said, was very prevalent in the district in which they occurred, but this is the only reason which he gives for considering them to be of tuberculous origin. As yaws, however, is far more prevalent there than tuberculosis, it would seem to me that the argument, based on coincident prevalence, would be far more in favour of a frambœsial than of a tuberculous origin. I am not aware that those who attribute these symptoms to syphilis adduce any better reason than the above in support of their theory. As Dr. Leys has pointed out, these lesions are met with in places in which syphilis is rarely seen or has never existed. Dr. Daniels encountered them in Fiji, where there is no syphilis, and he certainly had no reason to assign them to tuberculosis.

I wish to explain at this point that the destructive ulceration of the nose and palate which I attributed to yaws did not attack bone. In this fact there appears to be a difference between Dr. Leys' cases and mine. When I met with the only case in the district in which the bones of the nose and palate had been destroyed, I wrote to Mr. Hutchinson on the subject, requesting his opinion, and he assured me that his experience had led him to the conclusion that lupus could safely be excluded in such instances, as it never attacked bone, and that he considered the case to be one of syphilis. Dr. Nicholls refers to the same case in his report already alluded to as an example of syphilis in a yaws patient.

It would seem from Dr. Daniels' description of the naso-palatine symptoms which he observed in Fiji that the lesions in his cases were limited, as in mine, to a destructive ulceration of the soft tissues and that, in this respect, they also differ from the conditions mentioned by Dr. Leys, who states that "the disease begins in the soft parts, but after reaching the soft palate, and eating its way through its entire thickness, attacks the bone of the palate and nasal septum, finally destroying these entirely."

While in Dr. Leys' cases the destruction of tissue was so extensive as to attract the attention of a casual visitor, the noseless condition of the patient revealing his disease, in mine there was practically no outward manifestation of the affection.

I would not, however, conclude that the lesions in the patients in Guam had a different origin from those observed by me in Dominica, or by Dr. Daniels in Fiji. It is possible that the same cause, owing to peculiar conditions, had produced a severer form of the same disease in the first-mentioned place, whether the symptoms be those of a special local disease or a later manifestation or sequela of yaws. It would be strange if, supposing the symptoms to be those of a disease, *sui generis*, or rather of two different local special diseases, the lesions in one affection should be limited to the soft parts, and in the other should include both them and the bony structures.

Is there anything in European pathology which can guide us towards an opinion as to the nature of these symptoms? Certainly, considering the ages at which they appear and the absence of any evidence of hereditary syphilis, it is not at all probable that syphilis can account for them in the majority of the cases in which they are observed. Of the thirty cases seen by Dr. Leys during 1904, as many as seventeen were school children. On the other hand, similar lesions are sometimes the result of scrofulous influence. Cases have been reported in which an obstinate ulceration of the pharynx in scrofulous children has extended to the tissues of the soft and hard palate as well as to the nares, until the nose falls in and the greater portion of the soft and hard palate are destroyed. Can the lesions under consideration have had a similar origin? The general condition of the patients so afflicted does not certainly suggest a scrofulous taint. "The patients," says Dr. Leys, "remain muscular, well fleshed, and well blooded," nor were there any signs of scrofula in those who came under my observation.

Dr. Leys very naturally points to the fact that these lesions have only been found in certain places and not in others in which yaws prevails as extensively, as a proof that they are not connected with yaws. He instances Nevis as a place in which yaws has been particularly prevalent for a number of years and in which such symptoms have never been observed. It is certainly the case that at the time I met Dr. Leys, I did not remember having met any case in Nevis in which there was any ulceration of the nose or palate. I have since then, however, found notes of three cases which have been under my care—patients aged 15, 17, and 19 respectively—in which the septum of the nose has been ulcerated, and a hole left in it the size of a sixpence. The mucuous membrane is studded with small encrusted tubercles. This condition, it will be urged, does not in any way resemble the severe destructive ulceration of the nose and palate which is under consideration. This is true; but may it not be a milder form of the same process? (I was informed by the mother of one of the patients, a muscular, well-developed young fellow, aged 19, that he had never had yaws.) Is it not possible that the severity of such lesions may be proportionate to the severity of the other symptoms of yaws? Yaws, as I have seen it in Nevis, is very different from that disease as it came under my notice in Dominica. Here, in Nevis, the cases are all in children under 12 years of age, and the cutaneous lesions (except the initial ulcers) consist only of "squames" generally, and occasionally of papules. Nowhere have I seen any of the granulomata with crusts which are so commonly observed in Dominica—both in children and adults. This difference may be due to the fact that the children affected with yaws in Nevis have received more regular medical care than those in Dominica, and that they have been treated with small doses of mercury, which have modified the symptoms of the disease; or it may be that the affection in Dominica, owing to climatic conditions (greater dampness, &c.), is of a more virulent type. Allowing, therefore, that the destructive ulceration of the nose and palate is due to yaws, we should expect to find this condition most pronounced in places in which the other symptoms of the disease are most virulent, and *vice versa*.

Another point to be remembered in this connection is the possibility, to which I have already drawn attention in a previous paper, viz., that yaws may manifest itself both as a local as well as a constitutional disease. While the "squames" and papules of yaws may be cutaneous manifestations of the constitutional affection, the encrusted granulomata and the later symptoms may be the result of the local action of the yaws microbes. Similarly the destructive ulceration of the nose and palate may be caused by these microbes acting directly on the tissues in places in which the disease exists in its most virulent form.

Your obedient servant,

J. Numa Rat

(*Medical Officer, Nevis, B.W.I.*)

The second International Congress on "School Hygiene" will be held in London on August 5th to 10th, 1907.

Professor R. Boyce, F.R.S., delivered an address on "The Prophylaxis of Yellow Fever, as the Result of the 1905 Epidemic in Central America and New Orleans," at the International Medical Congress in Lisbon

Translation.

PRELIMINARY STATEMENT ON THE RESULTS OF A VOYAGE OF INVESTIGATION TO EAST AFRICA.

By R. Koch.

(*Translated from the German by P. Falcke.*)

(*Continued from page* 105.)

The conditions thus resemble those of the malaria parasite, which at the commencement of their sexual stage also exhibit a similar differentiation; they, too, having some forms poor in plasma, with plentiful close chromatin, and others rich in plasma but with loose chromatin. I conclude, therefore, that here, too, we have an instance of sexual differentiation, the forms rich in plasma representing the females, and the slender ones, poor in plasma, the males.[1]

Whether or not these forms copulate, or whether, as in the malaria parasite, microgametes are first formed, I cannot say, but so far as my observations go the latter process appears the more probable.

In the hindmost part of the stomach, moreover, forms are found which appear to me to represent the further development of the fertilised females. These are very large trypanosomes which possess only one blepharoplast with its flagellum, but several nuclei. The number of nuclei is sometimes two, mostly four (figs. 18 and 19), and in a few cases even eight.

Nuclear fission is, indeed, known to occur even in the simple (asexual) multiplication of trypanosomes, but in such cases the number of blepharoplasts, with their flagella, always equals that of the nuclei.

It stands to reason, therefore, that we have to do with something else than simple fission, as here the blepharoplasts do not multiply, but only the nuclei. Although I have not witnessed the process, I consider it likely that these multi-nucleated trypanosomes split up into a corresponding number of parts, and so form the extremely minute forms which I have so frequently met with in infected flies.[2]

These latter are simple globular cells, with a single nucleus (fig. 20), and exhibit all transitions to those with nucleus and blepharoplast, to which a flagellum is afterwards superadded (figs. 21 and 22). The shape then becomes elongated, and more and more like the trypanosome. Usually these young forms may be recognised by the blepharoplast being placed anteriorly to the nucleus, towards the flagellar end of the organism (fig. 23). It is only later that it moves near to the nucleus and gradually makes its way to the posterior end of the trypanosome.

Besides these, other forms appear for which I can as yet furnish no satisfactory explanation. One of these consists of longitudinal bundles of long, thin trypanosomes which are often rolled up, and look as if they were produced by the segmentation of a large cell. There are also tape-like trypanosomes, often of remarkable length, with obtuse extremities. In these forms the blepharoplast is placed anteriorly and the flagellum is very short (fig. 24).

It may be remarked that in the fluid squeezed from the proboscis of the fly there are, besides other forms, nearly always some trypansomes which resemble the trypanosomes of the blood of infected animals in size and appearance. It may be assumed that infection is transmitted by these. I failed to infect rats by means of the trypanosomes from the stomach of flies.[3]

As yet, too, I have failed to get any positive results by making Glossina feed on animals infected with trypanosomes. When the flies were fed on oxen which had just been attacked with tsetse disease, and harboured many trypanosomes, most of the parasites disappeared as the blood was digested. The trypanosomes refused to develop, and no permanent infection of the flies was found to result. It was only when the flies were made to bite beasts (oxen, mules) which had been long infected, and only incidentally harboured a few trypanosomes in their blood, that a few flies became infected. I am therefore inclined to suspect that all blood trypanosomes are not capable of infecting Glossina, but only such as happen to be at some stage with which we are as yet insufficiently acquainted. It seems probable that the infective type of trypanosome is to be found in those large game animals which are little susceptible to tsetse, such as antelopes and buffaloes.

I have frequently found infected flies in regions where they could have been infected by no other agency than that of large game, in the blood of which, as is well known, only very few trypanosomes are present. In the Lungera Valley, where the highest percentage of infected flies was found (17·4 per cent.), there were no oxen, and only very few antelopes. On the other hand, there were goats and sheep which were apparently quite healthy, but most of them had a few trypanosomes in their blood.

In regard to the Glossina themselves, it should be noted that the males as well as the females suck blood, and that both sexes become infected and are capable of conveying infection.

G. fusca flies and bites by night. In order to keep this species alive for any length of time they should be given the opportunity of sucking blood every two or three days. The males of *G. fusca* usually sit on shrubs and bushes or on the ground by the wayside. The females are shier than the males, and only appear when they scent animals. Hence flies caught away from animals are mostly males. Amongst the flies caught on animals (mules, asses, oxen) there are always some females, and occasionally they may be as numerous as the males.

The females do not lay eggs like most other diptera, but a single whitish larva, which in a few hours changes into a pupa. *G. fusca* gives birth to only a single larva at a time, at intervals ranging from ten

[1] In my detailed work I shall mention in how far these sexual forms have been seen by other observers.

[2] Rabinowitsch has already seen the same young forms in the trypanosoma of rats, moreover Novy and M'Neal have observed them in their cultures of trypanosomes; possibly also Castellani saw them in the cerebro-spinal fluid of sleeping sickness patients.

[3] The Sleeping Sickness Commission likewise had negative results in their experiments to transmit the trypanosoma from *G. palpalis* to monkeys. "Reports of the Sleeping Sickness Commission of the Royal Society," No. vi., p. 286.

to twenty days, according to the temperature of the the air, so that the females produce but two or three progeny in a month. The propagation of the Glossina, therefore, is very slow compared to that of most insects. This appears to be the weakest point in the cycle of infection of the trypanosomes, and may, perhaps, offer a standpoint for an effective method of combating trypanosome diseases.—(*Deutsche Medizinische Wochenschrift, November* 23*rd*, 1905.)

JOURNAL OF THE R.A.M.C., APRIL, 1906.

REPORTS OF THE COMMISSION APPOINTED BY THE ADMIRALTY, THE WAR OFFICE, AND THE CIVIL GOVERNMENT OF MALTA, FOR THE INVESTIGATION OF MEDITERRANEAN FEVER, UNDER THE SUPERVISION OF AN ADVISORY COMMITTEE OF THE ROYAL SOCIETY.

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I.—GOATS AS A MEANS OF PROPAGATION OF MEDITERRANEAN FEVER. By Major W. H. Horrocks and Captain J. Crawford Kennedy.

ABSTRACT.

In Part III. of the Reports of the Commission a preliminary note was published on this subject, in which it was shown that goats in Malta suffer from Mediterranean fever, and excrete the *Micrococcus melitensis* in their milk and urine. The further study of this subject may be divided into the following parts:—

(1) Examination of goats living in pens (*a*) in the immediate neighbourhood of Valletta and Sliema, and (*b*) in the more remote parts of the Island.

(2) Experiments made to determine the possibility of infecting animals by feeding them on milk cultures and infected milk

(3) Experiments to determine the mode in which the goats themselves become infected.

(4) Experiments to determine whether it is possible to destroy the *M. melitensis* by Pasteurisation of the infected milk.

General Summary of Results.

(1) Judged by the serum reaction, 41 per cent of the goats in Malta are infected.

(2) Ten per cent. of the goats supplying milk to various parts of Malta appear to excrete the *M. melitensis* in the milk.

(3) The excretion of the specific microbe may continue steadily for three months without any change occurring in the physical character or chemical composition of the milk, and without the animal exhibiting any signs of ill-health.

(4) Some infected goats may lose flesh and their coats may become thin; they may also suffer from a short hacking cough. A febrile condition, however, has not been observed.

(5) Goats may have a marked blood reaction (1—100), and yet never excrete the *M. melitensis* in the milk.

(6) If the blood serum or milk does not agglutinate the *M. melitensis*, the specific microbe is not found in the milk.

(7) There is no constant relation between the amount of agglutinins in the milk or blood and the excretion of *M. melitensis* in the milk; but the higher the dilution of the serum which agglutinates the *M. melitensis*, the greater is the probability of finding the *M. melitensis* in the milk.

(8) The excretion of the *M. melitensis* in the milk may be intermittent, appearing for a few days and then disappearing for a week or more.

(9) A blood reaction may exist for some weeks before the *M. melitensis* is excreted in the milk.

(10) If blood cannot be obtained, the milk reaction with the *M. melitensis* (Zammit's test) is a good indication of infection.

(11) The milk agglutination test is a surer indication of the *M. melitensis* being excreted in the milk than the serum reaction.

(12) Monkeys and goats can be infected by feeding with cultures of *M. melitensis* isolated from milk, and also by feeding with infected milk itself.

(13) The incubation period in feeding experiments appears to vary between three and four weeks.

(14) Monkeys infected by feeding sometimes suffer from a typical wave of fever and lose flesh, at other times they show no obvious signs of ill-health, and may even gain in weight.

(15) When monkeys become infected by feeding with milk the lymphatic glands always contain far more colonies of the *M. melitensis* than the spleen. This fact suggests that the specific micrococci contained in the food are carried to the lymphatic glands and there undergo considerable multiplication. It has not yet been proved that the mesenteric glands are always infected at an earlier date than the femoral and axillary glands, but Experiment IV., feeding with milk, shows that this may be the case at times.

(16) It has been demonstrated that goats may become infected by feeding on dust polluted with urine from cases of Mediterranean fever. The excretion of *M. melitensis* in the milk resulting from such infection is a late phenomenon, only appearing about seventy-four days after the blood reaction has developed.

(17) It has not been possible yet to convey infection from goat to goat by means of mosquitoes or *Stomoxys calcitrans*. If mosquitoes do carry the infection, it seems more probable that the microbe is transferred from man to goat, than from goat to goat.

(18) Agglutinins may be transferred from the mother to the fœtus *in utero*. Pregnancy appears to follow a normal course in infected goats.

(19) Pasteurisation (68° C. for ten minutes) destroys the *M. melitensis* present in infected goats' milk.

II.—THE INCIDENCE OF MALTA FEVER AMONGST THOSE EMPLOYED IN THE MILITARY HOSPITAL, VALLETTA, DURING THE YEAR 1905. By Captain J. Crawford Kennedy, R.A.M.C.

Kennedy finds some evidence of the transmission of Malta fever by mosquitoes; of the liability of persons engaged in nursing, night duty, and cleaning latrines to contract Malta fever; and of the greater

prevalence of the disease in the Valletta Hospital staff compared with other hospitals in Malta.

III.—The Pathogenic Mosquitoes of Jamaica.
By Major F. M. Mangin, R.A.M.C.

In Jamaica, one has unequalled opportunities of making the acquaintance of certain species of this group of the diptera, each of which in itself is the carrier either of malaria, filariasis, or yellow fever, respectively. The species alluded to are: *Culex fatigans*, the carrier of filariasis; *Stegomyia fasciata* and *S. mosquito* (Robineau-Desvoidy), the carriers of yellow fever; and the five species of Anopheles found in this island; these are—*Anopheles punctipennis*, *Arribalzagia maculipes*, *Cellia argyrotarsis*, and *Cyclolepidopteron grabhamii*, together with *Cellia albipes*, the commonest form of Anopheles. In addition, there are numerous other species of Culex, but these are not yet proved to be pathogenic.

Miscellaneous.

SANTYL—A NON-IRRITATIVE INTERNAL ANTI-GONORRHŒIC.

By Dr. H. Bottstein.
Hamburg.

(*Translated from the German by P. Falcke.*)

Dr. Vieth, of Ludwigshafen-on-the-Rhine, reported on "The Mode of Action of the Balsams" in the *Medizinische Klinik*, No. 5, 1905, and made a statement regarding the preparation and effect of a new balsam, *i.e.*, santyl. According to these statements this drug is preferable to other balsams on account of its non-irritative qualities and its tastelessness. Up to the present R. Kauffmann reports on forty-five cases treated with santyl (*Monatshefte f. prakt. Dermatologie*). He states that santyl is a remedy possessing the advantages of a new santal preparation, while also exhibiting the specific effects of salicylic acid; it is, in addition, free from the unpleasant after-effects of other balsams. Santyl is, moreover, odourless and tasteless, and can be taken as oil in the form of drops. It has yielded good results in the case of female patients with gonorrhœa. Sensitive women who could not swallow the capsules, and objected to other preparations on account of the taste or smell, took santyl in drops without aversion. In santyl, also, the irritative effects on the kidneys are less than in the former preparations. In my total of sixty patients treated with santyl only two complained of slight transient sensitiveness in the region of the kidneys. One patient refused to take the oil, asserting that he had an idiosyncrasy against all kinds of oils. Recently, also, santyl can be obtained in capsules, but it is seldom used in this form except in exceptional cases; travellers, for instance, prefer them in this form on account of their convenience. The progress that santyl represents must not be under-estimated. In those cases, also, in which, for obvious reasons, secrecy has to be maintained, it does not betray the patient by any evil odour, as is known to be the case in the other sandal preparation.

I would like to call attention to the fact that I have only taken fresh infections under consideration, as, in chronic gonorrhœa, the effects, as a matter of course, are not so striking. For acute gonorrhœa, with its subjective disorders, santyl is an actual specific, and is particularly valuable when the course of the infection is severe and there are marked symptoms of inflammation. Kauffmann observed favourable results in posterior gonorrhœa, and my experience confirms his opinion. Eighteen cases of gonorrhœa of the posterior urethra, which I treated with santyl, ran a light course without complications. The urine also rapidly became clear, and only in one case did I find it necessary to exhibit santyl combined with urotropin, as has been recommended by others.

Statements are frequently made that one drug or the other is able to cure acute gonorrhœa without local treatment. Other authorities, on the contrary, assert that gonorrhœa cannot be cured by means of internal remedies only. P. Meiszner is most positive, and writes as follows in his "Experiences with Arhovin": "It must be understood from the start that a treatment for gonorrhœa which is wholly internal is impossible. Internal preparations for gonorrhœa must therefore only be regarded as adjuvants." Kauffmann is no less energetic in his assertions that it is impossible to cure gonorrhœa without local treatment, and all objective observers will agree with him. If this standpoint is taken, and it is justified by practical experience, the effect of balsams will still be valued, but to a limited extent. The subjective disorders which very frequently trouble patients can mostly be removed by the balsams.

The effect of the various balsam preparations which are used in the treatment of gonorrhœa is about the same, whether balsam, copaibæ, or ol. santali is used. Gonosan, which has recently been highly recommended, is said by some authorities to possess anæsthetic properties; nevertheless, other sandal preparations which do not contain kawa (such as santyl) also remove the pains. There is one great difference between the various balsam preparations, namely, the accessory effects. Copaiba balsam frequently causes exanthema, and has therefore been abandoned in favour of sandal oil, in which cutaneous symptoms occur much less frequently. Sandal oil, however, also has several disadvantages, as is well known. Apart from the rough taste which is covered by taking this preparation in capsules, disorders of the stomach or renal pains occur in quite one-third of the cases. The same applies to gonosan. I cannot say that I have observed that it has less unpleasant after-effects than pure East Indian sandal oil; it is also not pleasant to take, as it contains 80 per cent. of pure sandal oil.

In santyl the principal ingredient of sandal oil, santalol, is chemically combined with salicylic acid, producing a neutral and almost tastless oil. Santyl is chemically analogous to salol, which is the salicylic acid combination of phenol. Such combinations pass through the stomach almost unchanged and are only split up and absorbed in the intestine. The disagreeable effects on the stomach are thereby correspondingly decreased. Santyl can be demonstrated in the urine as early as one hour after it has been taken.

I have used santyl altogether in sixty cases of acute gonorrhœa. It is not necessary to give the histories of the disease, but I may remark that amongst my cases

there were several particularly severe ones in which santyl gave the most satisfactory results. In two cases also with terminal hæmaturia convalescence set in soon, the hæmorrhage ceasing in two and three days respectively, while the pain during micturition, which at first was very great, quite disappeared.—*Medizinische Klinik*, No. 11, 1905.

SANTYL-KNOLL.

A new sandal-wood preparation for the internal treatment of gonorrhœa has been introduced by Knoll and Co., 27A, St. Mary-at-Hill, London. The preparation may be taken in drops or capsules; it is free from disagreeable smell and taste, and does not cause gastro-intestinal irritation nor offensive eructations.

Reviews.

BERI-BERI.—"OBSERVATIONS IN THE FEDERATED MALAY STATES ON BERI-BERI." By C. W. Daniels, M.B.Camb., M.R.C.S., late Director, Institute for Medical Research, Kwala Lumpur, F.M.S. E. G. Berryman and Sons, Blackheath Road, London, S.E. 1906. Pp. 105. Price 3s. 6d.

Published as Part I. of vol. iv. of "Studies from Institute for Medical Research, Federated Malay States," Dr. Daniels work on beri-beri is deserving of close attention. The recent works on beri-beri by Dr. Hamilton K. Wright, Dr. Travers, Dr. Braddon, Dr. Haviland, Dr. Durham, Dr. T. S. Kerr, and many other observers, are reviewed and considered in all their bearings, and their several theories and conclusions judicially handled. Every sentence in Dr. Daniels' observations is written with evident care, having due regard for the work and opinions of others, and a keen appreciation of their efforts to elucidate the cause of beri-beri. It is impossible to quote from a book in which every paragraph bears directly on the context, for the argument is so closely and precisely followed that extracts would be meaningless. We can only state the general conclusions arrived at by Dr. Daniels. These are:—

(1) "That beri-beri is an infectious disease. As a rule, a short period of incubation and a period of exposure of less than three months is requisite for full development of the disease where the 'endemic index' is high.

(2) "That there is no definite proof that an intermediate host is required, but the balance of evidence is against its being conveyed by earth, air, water, or food, or contamination with sewage or other fæcal matter.

(3) "That there is some evidence that for a short period only after the occupation of small spaces, beds, bedrooms, &c., the 'poison' or carrier of infection may remain.

(4) "That food, either as regards quantity and quality, its nature or relative proportions, may have an effect on the susceptibility of the patients, though the proofs are not conclusive, but is not the causative agent.

(5) "That if an intermediate host for the unknown parasite is required, it must be either a cimex or a pediculus. That pediculi as carriers would better explain the incidence of the disease than any other blood-sucker.

(6) "That a closer enquiry into the earlier stages of the disease is required. That where opportunities for such an enquiry occur, renewed attention should be bestowed on the blood and tissues, with a view to determining the presence or absence of any protozoon.

(7) "Prophylaxis. That in view of the failures of various attempts at disinfection of buildings and places, and of various modifications of diet to have marked effects, more attention should be paid to limiting the chances of personal infection, and that particular attention should be paid to the personal cleanliness, freedom from vermin, and isolation of early or trivial cases of the disease.

"The importance of the disease, affecting as it does the imported labour of the country, causing prolonged sickness and frequently death, cannot be over-estimated in a rich country so sparsely populated as the Federated Malay States. There is evidence that the disease is less common and less fatal than a few years ago; but directly, and as a complication of other diseases, it is still the main cause of the high mortality in the healthiest period of life, amongst the Chinese.

"Every earnest endeavour to improve the conditions of life that has been made in the past has resulted in an improvement. The number of cases is diminishing, and the mortality from the uncomplicated disease less than ever.

"The scope of the enquiries has, as a result of the observations of numerous workers, been diminished, and the prospects of an early solution of the cause of the disease and of its mode of propagation may be confidently anticipated by future workers at no distant date."

We congratulate Dr. Daniels upon a book which is a model of scientific literary effort, and one which places our knowledge of beri-beri of to-day accurately before us.

New Instruments, &c.

ILLUSTRATED PRICE LIST OF ELECTRO-MEDICAL APPARATUS.—K. Schall, 75, New Cavendish Street, London, has sent us an excellently illustrated catalogue of electro-medical apparatus. The address will, no doubt, be useful to readers.

BECK, R. and T., Ltd., 68, Cornhill, London, have introduced a new form of "Ehrlich" Eyepiece for counting blood corpuscles which fits their "London" Microscope.

Drugs and Remedies.

HETRALINE: A URINARY DISINFECTANT. — Dr. del Amo, in a paper on the antiseptic value of hetraline, states that, in doses of seven grains, repeated four times daily, this drug was useful in cases of bacteriuria. In acute and chronic cystitis, catarrhal urethritis, and the urethritis due to stricture, hetraline is as effective as urotropin, and has the advantage of being less irritating to the tissues.

Medical Notes.

THE EDIBILITY OF THE SPLEEN.

The reason why the spleen, of all abdominal solid organs, is practically the only one not used for human food, is difficult to explain. Dr. Williams, in *American Medicine*, February 10th, brings forward a plea for its consumption, and states that when stewed the spleen is pleasant to taste; it must be cooked and eaten when quite fresh. Considering the physiological importance of the spleen, it is peculiar it has never been used either as a medicinal agent nor as a part of ordinary diet.

CHOLERA.

In the Philippines cholera is spreading, especially in the villages along the coasts and on the rivers. As the villages drain directly into the rivers, a continuance of the epidemic is probable.

SMALL-POX IN CALCUTTA.

Between December, 1905, and March 1st, 1906, it is estimated there have been 5,000 cases of small-pox in Calcutta.

CREEPING DISEASE.

Moorhead, J.D., in the *Texas Medical News* of February, describes a skin affection in a boy, aged 5, said to be suffering from Brazilian worm in his foot, which has been given the name "creeping disease." The infection was believed to come from a family from Brazil. The worm travels in the layers of the epidermis at the rate of from ½ to 1 inch in twenty-four hours, leaving a raised line of epidermis about ½ inch wide. The treatment consisted of excision of the part at the point where the worm is advancing, or by freezing this neighbourhood with ethyl chloride spray.

SEVERAL readers of the Journal have asked for information concerning the meaning of the opsonic index. Stated shortly, it may be explained as follows: Wright and Douglas have shown that washed leucocytes possess no phagocytic power when brought in contact with staphylococci, but if normal serum or blood plasma is first added to the staphylococci and then brought in contact with washed leucocytes, the phagocytic action of the leucocytes is re-established. This power seems resident in a substance contained in the serum termed opsonin; to ascertain the opsonic power of a given specimen of blood. the volume of serum is added to equal volumes of a bacterial suspension and of washed leucocytes. After this mixture has been incubated at 37° C. for fifteen or twenty minutes, microscopic specimens are mounted, fixed and stained, and the bacteria within the leucocytes counted. The number of bacteria within the leucocytes divided by the number of leucocytes counted gives the opsonic index.

Notes and News.

THE growing of cotton in the Federated Malay States is attracting some interest. The cotton, although of qualities somewhat inferior to Egyptian cotton, is stated to be of fair quality, and it is hoped the cultivation may prove remunerative.

MALARIA AND MOSQUITOES.—In Barbados the absence of Anopheles mosquitoes and of malaria is a fact which is well known. The explanation of this phenomenon has been lately attempted to be explained by Mr. C. K. Gibbons to the presence of a small fish, known locally as "millions" (*Girardines versicolor*), which preys on the larvæ of mosquitoes.

Yet another medical journal was added to the long list of American medical journals on January 1st, 1906, when No. 1 of vol. i. of the *Bulletin of the University of Nebraska* appeared. Henry B. Ward contributes an elaborate paper on "*Filario loa.*"

YELLOW FEVER.—Gorgas states that he has known the Stegomyia mosquito live 150 days in captivity.

RESULT OF THE EXAMINATION FOR THE DIPLOMA OF TROPICAL MEDICINE, UNIVERSITY OF LIVERPOOL, HELD ON MARCH 26, 27, AND 28, 1906.

Examiners.

External Examiner, Colonel D. Bruce, C.B., F.R.S.; Internal Examiners, Professor R. Ross, C.B., F.R.S., D.Sc., F.R.U.C.; J. W. W. Stephens, M.D.; C. J. Macalister, M.D., C.M.; R. Newstead, A.L.S, F.E.S., Examiner in Medical Entomology.

The following candidates have been recommended for the Diploma in Tropical Medicine:—

F. A. Arnold, M.B., D.P.H.
J. B. Bate, L.S.A.
J. Dundas, M.B.
N. Faichnie, Major R.A.M.C., M.B.
D. F. Mackenzie, M.B.
A. Pearse, Major R.A.M.C., D.P.H.
R. D. Willcocks, Captain I.M.S., M.B.

RESULT OF THE EXAMINATION, LONDON SCHOOL OF TROPICAL MEDICINE, 20TH SESSION, APRIL, 1906.

The following candidates passed the examination for the Certificate in Tropical Medicine.

Captain S. Anderson, I.M.S., M.B., C.M.Glas., 1896, with distinction.

H. E. Arbuckle, M.B., Ch.B.Edin., 1900, with distinction.

Captain B. H. Dutcher (U.S. Army, M.D.Coll. P. and S. Columbia University, New York), with distinction.

G. J. Pirie, M.B., Ch.B.Aber., D.P.H. 1905 (Colonial Service), with distinction.

A. G. Eldred, M.R.C.S., L.R.C.P. (Colonial Service).

H. Kramer, M.B., Ch.B.Edin., 1902.
P. H. MacDonald, M.B., Ch.B.Edin., 1899 (Colonial Service).
B. Moiser, M.R.C.S., L.R.C.P., M.B.Lond., 1904 (Colonial Service).
A. Reid, M.R.C.S., L.R.C.P., 1900, D.P.H.Durh., 1902, M.B.Durh., 1903.
W. Rogers, M.B., B.Ch.Edin., 1900 (Colonial Service).
W. E. Ruttledge, M.R.C.S., L.R.C.P., 1900.
A. L. Wykham, M.D.Howard Univ., 1887, L.S.A., L.M.

The "Ultra Microscope."

The ultra microscope, designed by Liedentopf and Szrgmondy, and constructed by Zeiss, has had no better success in detecting the organism of yellow fever than the familiar oil immersion. The idea of this instrument is not, strictly speaking, to bring into view, but to notify, the presence of bodies too minute for recognition by ordinary microscopic vision. Such bodies appear as shining points without any definite outline. But even in normal serum the points are so numerous that it is impossible to draw any conclusion as to the presence or absence of specific organisms.

The instrument has been tested in yellow fever by M. Otto and R. O. Neumann, who have recently made an expedition to Brazil to study that disease, but with no better result than their predecessors, except perhaps that they have bearded the lion of disease without loss of life or health, which alone should be a matter of congratulation in the case of a malady to which so many investigators have fallen victims.

Protection by Serum and Toxin.

A good deal of work is being done in various laboratories with the view of producing an anti-trypanosomiasis serum and to those interested in the subject the following references of recent works may be useful. In the current issue of the *Bull. de l'Institut Pasteur* abstracts are given of the following papers on this subject: Dresing, in the *Archiv. f. Schiffs. u Trop. Hyg.*, October, 1905, p. 427; Schilling, *Zeitschr. f. Hyg.*, 1905, p. 149; and Kleine and Mollers, *Zeits. f. Hyg.*, 1906, p. 229. The results are encouraging, distinct immunity being evidenced in experimental work, but their attempts to protect transport animals do not appear to have been so satisfactory, and the injections themselves do not appear to be entirely without danger.

In the same issue abstracts are given of two papers on the production of immunity against cholera infection by S. Seikouski and by K. Schmitz in the *Persglad lekaroki*, 1905, p. 746, *et seq.*, and the *Zeitschr. f. Hyg.*, December, 1905, p. 1, respectively, but neither appear to have succeeded in conferring immunity of sufficient duration to be of practical use in dealing with cholera.

In countries where cholera is endemic, or, at least, where the danger recurs every year, nothing short of an immunity as long as that conferred by vaccination against small-pox is likely to be extensively adopted, as it is too much to expect people to undergo the by no means considerable inconvenience and even risk of a protective inoculation every few months or so, and, in a minor degree, the same remark applies to the case of plague.

It must be remembered that for a certain length of time susceptibility is increased by the whole class of protectives which rely on the introduction of toxins, and that even the injection of the serum of immune animals is not without its dangers, so that for practical purposes what is required in either toxin or anti-toxin is that its effects should last long enough to be available for use at times when the plague *pro tem* is not epidemic.

French and English Mortality and Sickness on the Gold Coast.

The *Lancet* of February 3rd contains an instructive abstract of the health statistics of the French tropical colonies based on a report in the *Archives de Medecine et de Pharmacie Militaires* for January, 1906, from which we extract the subjoined table:—

French colonial troops stationed at—	Europeans				Natives		
	Average Strength	Sickness per 1,000	Deaths per 1,000	Invalids per 1,000	Average Strength	Sickness per 1,000	Deaths per 1,000
1903							
Western Africa	1,862	1,181	21·4	179·9	5,138	282	12·8
Annam-Tonkin	10,248	886	24·3	118·3	13,777	606	21·9
China Reserve Brigade	2,771	848	11·5	101·4	1,087	478	9·4
China Army of Occupation	1,672	924	10·1	61·0	—	—	—
Cochin China ..	2,121	1,285	33·0	205·5	1,625	1,063	47·3
Madagascar ..	4,812	1,091	17·6	187·2	7,202	376	12·9
Réunion	862	878	10·4	92·8	—	—	—
Martinique ..	914	1,611	10·9	214·4	—	—	—
New Caledonia	728	365	12·3	79·6	—	—	—
Tahiti	103	335	0	19·4	—	—	—
St. Pierre and Miquelon	14	143	0	0	—	—	—
India	4	0	0	0	142	795	7·0
Tchad	72	986	27·7	13·8	750	811	22·3
Guadeloupe ..	173	2,132	11·5	404·5	—	—	—
Guiana	194	644	5·1	242·2	—	—	—
	26,550	993	19·8	139·7	30,621	523	18·7

It is interesting to compare French results with British in West Africa.

The French troops so employed are, it must be remembered, a long service corps, composed of men who have already gone through the term of military service compulsory on every Frenchman, and so contain none of the callow youths which the exigencies of recruiting compel us sometimes to send to India, and though probably a distinctly younger body of men than our British colonial officials, will be, like them, men in the prime of life, and therefore fairly comparable, especially as the principal causes of death and invaliding are of a sort that attack all ages with tolerable uniformity. It is further to be noted that in addition to the sickness indicated above, all of which was of a serious character, a very large number of men, equivalent to 306·9 per thousand of strength, were treated for slight ailments "à la chambre." Against the comparative youth of the Frenchmen, too, may be placed the fact that like "Tommy Atkins," "Piou piou" is

probably a less careful person than civilians of good social position.

In the same year (1903) the mortality, &c., of Europeans on the British Gold Coast was returned as below :—

How Employed	Number	Deaths	Invalided	Death-rate per 1,000	Invaliding rate per 1,000
Officials	326	5	25	15·3	76·7
Mercantile Firms, &c. ..	335	12	18	35·8	53·7
Mining Companies ..	1,043	20	92	19·2	88·2
Missions	92	2	2	21·7	21·7
Totals	1,796	39	137	21·7	76·3

By a curious coincidence the total number of the two populations compared differs but little, and the mortality per thousand coincides almost exactly. The French invaliding is, however, more than double of ours.

A further point worthy of note is that however insalubrious a place must be where men are under medical treatment for ailments, great and small, four times in the year, the West Coast is almost a sanitorium compared with Cochin China, with a mortality of 33 and an invaliding roll of 205·5 per thousand, and is distinctly better than Tonquin. Now, the French Possessions in the Malay Peninsula actually march with ours in Upper Burmah, and it is hardly likely that the frontier that divides our possessions demarks any particular difference of insalubrity.

Most medical men who have practised in the East know that storax (*silaras*) is regarded as a most potent drug by the kaids and haqims, but few would be prepared to hear that India imports thirty tons of it annually, or that it is of sufficient commercial importance to render the question of its adulteration desirable by a Government official. However, Mr. D. Hooper, of the Indian Museum, has taken up the matter, and has discovered by chemical analysis that a large quantity of the drug is adulterated with pine resin. A paper on the subject has lately appeared, giving the results of the investigation, and the *Statesman* understands that the attention of the authorities has been drawn to the subject, so that care might be exercised in the future to obtain supplies of storax from authentic sources.

The Bombay Census.

The municipal census calculations have not yet been completed, though promised for Saturday at noon. Roughly speaking the population is put at 960,000, an increase of 190,000 on 1901.—*Pioneer Mail*, February 16th, 1906.

From the same journal we extract the following report of a speech by Lord Lamington on the virtue of cleanliness. If all our Indian Administrators held as sound and practical views on sanitation as the Governor of Bombay there can be no doubt that the history of hygiene in India would be more satisfactory than it has been.

"*Bombay, February 8th.*

"His Excellency the Governor, speaking last night at the annual meeting of the Bombay Sanitary Association, said that that Society and the St. John Ambulance Association proceeded on nearly the same lines—one was to meet a sudden emergency and the other was to inculcate the principles of proper sanitation, so that the lives of people in a great city like Bombay might be better preserved. If I remember rightly, he continued, it was at a meeting two years ago that a speaker declared that we had awakened the 'hygienic conscience' of the people, and from what I have been able to see for myself since my advent in your midst this has been strictly borne out. I cannot see myself that the people themselves lack in cleanliness either in their own persons—I am talking generally—or in their houses; but every one ought to extend their horizon and recognise their obligations not only to themselves but also to their neighbours and by practising the virtue of cleanliness they not only benefit themselves but their neighbours and help to preserve public safety. Man does not live alone; he has work in co-operation with his neighbours. Our duty is to persuade them to keep the outside of their houses as clean as they keep their own particular room. There is another matter—that of better ventilation. To my mind, it is brought home to us day by day by the medical authorities in every country, in every part of the world, that you cannot have too much fresh air. It is most deplorable even when I go round my own lines in Government House to see how, after a certain hour every little window is barred and barricaded as though they expect an attack from a foreign enemy. There is no possibility of fresh air, and whatever germs there are in this vitiated room go on multiplying. There are two great principles in which the majority of people want educating. One is to keep the outside of their houses or chowls clean, and the second is not to be afraid of fresh air."

We also extract an article on Professor Klein's new prophylactic for plague, which is of interest as indicating the trend of expert opinion in India on the merits of the new agent as compared with that of Haffkine's, which has been so long in use in that country.

"Professor Klein's report to the Local Government Board on his new plague prophylactic was forwarded to one of the leading experts upon the subject, who writes as follows :—

"'The experiments at present recorded are neither sufficient nor complete enough for an opinion to be formed as to the ultimate utility of this vaccine. It seems, however, that the results of the experiments do not sufficiently warrant the claims to superiority in comparison with the vaccine prepared by Haffkine. There is no doubt that Haffkine's method of prophylaxis has had a considerable amount of success. The Indian Plague Commission reported favourably on this method, and it is generally admitted that inoculation of this vaccine diminishes the incidence of attacks of plague, and that the mortality among inoculated persons is considerably less than among those not treated. The question as to the duration of the protection afforded is difficult to decide. It is probably not less than three months. There are certain disadvantages in this method which have prejudiced many against its use. Protection is not conferred on those inoculated for some days after the treatment, and during this period there is an increased susceptibility to an attack of plague. Consequently there is doubt as to whether its use in the presence of an epidemic is advisable. The protection afforded is not always complete, and is of short duration. Thus, while this vaccine is a valuable means of protecting temporarily against plague.

it is not a method of much practical use in face of an epidemic of plague. It not infrequently occurs that after inoculation the individual suffers from severe symptoms somewhat resembling those of the disease itself.

"'The new prophylactic of Klein does not appear to solve any of the present difficulties. His material is highly toxic. Like most other vaccines, it contains the dead bacillary bodies and their toxins. It also contains many other unknown constituents, the result of the inflammatory reaction of the tissues. The immunity conferred by its application is doubtless principally due, as in the other vaccines, to the toxins and the dead bacilli. It has not yet been ascertained at what time after the inoculation the immunity is established, and for what period it persists. Klein found the immunity present one to thirteen weeks after inoculation, a time limit which is inferior to that established by Haffkine's vaccine. The possibility of standardising the prophylactic by injection into rats is of value, but it is equally possible to standardise Haffkine's vaccine by injection into the guinea-pig. The new method described by Professor Klein is doubtless a means of affording protection against an attack of plague, but until many more experiments are completed to establish the nature and extent of this immunity it is premature to claim superiority over the other existing methods of vaccination. It is not simply a question of obtaining a cheap, easily prepared material. To combat plague, especially under the conditions which exist in India, there has yet to be discovered either a serum with curative properties or a vaccine which will confer a rapidly established and durable immunity, and be attended with no danger to those treated.'"

It may be remembered that in our issue of February 15th we reproduced a letter to the *Pioneer* from a correspondent in the Punjab on the occasional poisonous effects of the stalks of the millet known as jowar, when used as fodder for cattle, the writer stating that the people believed the poisonous action to be due to the presence of "small worms." The *Pioneer Mail* of February 16th contains a second letter from a Burmese official, which shows that the same view is held by the natives of far-away Burmah. It is well known that many insects are poisonous, so that it is by no means impossible that the native agriculturists may be correct in their belief, and the question is certainly worthy of investigation by the economic entomologist, if India chances to possess such a functionary.

Cattle Feeding on Jowar Stalks.

"Sir,—With reference to your article on cattle being poisoned by eating jowar stalks in your issue of January 13th last, and a letter from 'W.' in your issue of January 18th on the same subject, the following may be of interest:—

"The Settlement Officer, Magwe District, Upper Burmah, in his Settlement Report, seasons 1897-1903, remarks: 'In years of drought, when the plant (*i.e.*, jowar) becomes stunted and dried up, the stalks are poisonous to animals, and cattle sometimes die from eating them. In this district (Pakkoka) jowar is one of the main crops, and, of course, jowar stalks are used as fodder. The Burmans here tell me that in years of drought, before the ear has unfolded itself, an insect gets into the stalk; while so inhabited the stalks are poisonous, and, if eaten by cattle or ponies, cause death within a few hours. The insect appears to leave the stalk when the "ear" opens, which it would naturally do, of course, on the cessation of the drought.'"

A New Journal for Tropical Veterinary Medicine.

As for many years past it has been felt that there existed a distinct want for a scientific publication dealing with veterinary pathology in the Tropics, certain officers of the Indian Civil Veterinary Department have undertaken the publication of a quarterly periodical entitled the *Journal of Tropical Veterinary Science*, the first issue of which, dated January, recently made its appearance. Each number will, as far as possible, consist of original articles of scientific interest, with the exception of such pages given up to reviews and extracts from current literature as may appear to demand attention. Each of the three Editors—Major H. T. Pease, the Principal of the Punjab Veterinary College, Captain Baldrey, the Professor of Sanitary Science at the same Institution, and Mr. R. E. Montgomery, I.C.V.D., who is now on special duty investigating camel diseases—contribute articles to the first number, while Professor A. Lingard, Imperial Bacteriologist to the Government of India, has two articles. The journal is published by Messrs. Thacker, Spink and Co., and is excellently got up, clearly printed and illustrated with plates and diagrams. The annual subscription, including postage, is Rs. 12.8.—*Pioneer Mail*, February 28th.

The Medical (Lucknow) College Fund.

At a largely attended meeting held here and presided over by Mr. H. M. R. Hopkins, I.C.S., Collector, Rs. 17,000 were subscribed on the spot towards the Memorial Medical College, Lucknow. The principal speakers were Mr. Hopkins, and Syed Alay Nabi, B.A., and Munshi Narayan Pershad, M.A., Vakils. More subscriptions are expected.

Plague Work at the Parel Laboratory, Bombay.

During the past eight months, the Health Department have been engaged in trapping, poisoning and collecting rats, with the result that over 30,000 rats have been collected and sent to the Parel Laboratory for bacteriological examination every month, the Plague Research Commission supervising the work there. The report on the result of the examination of each rat is sent daily to the Executive Health Officer. When a rat is found to be infected the house or gully where it was found is marked "P.R." with the date, so that the premises and neighbourhood may be under observation. The Plague Commission are now working at Parel, and visit as many of the infected places as possible to collect material for their work. Cards are provided which are filled in by the district registrars giving information in detail about the rats and infected places, and the condition of the locality and its plague history. On an average, 1,100 rats have been examined daily at Parel, and the result sent at once to the Health Department. The proportion of infected rats recently increased from 2 to 20 per cent.—*Pioneer Mail*, March 28th, 1906.

Dr. Claus Schilling has been appointed head of the newly founded department of tropical diseases and hygiene established in Berlin in connection with the Institute of Infectious Diseases.

Seismic disturbances and prolonged drought have prevailed in several of the West Indian Islands;

St. Lucia and St. Vincent have suffered from severe earthquakes, and drought has been especially prevalent in Barbados, British Guiana, Grenada, and Trinidad.

THE PREVENTION OF YELLOW FEVER.

The Colonial Office authorities have issued a concise, practical, and clearly written eight-page pamphlet on "The Prevention of Yellow Fever." The general directions are based upon the assumption that "yellow fever can be absolutely suppressed by the application of simple, practicable, and non-costly methods," devoted to the prevention of infection of human beings by the bites of the Stegomyia mosquito. The pamphlet is illustrated by drawings of the *Stegomyia fasciata* and of the larvæ of Stegomyia.

His Excellency the Governor-General of the Sudan has directed that a Commission be appointed to investigate the possibility of the extension of "sleeping sickness" into Sudan territory. The Commission to be as follows: Lieut.-Colonel G. D. Hunter, D.S.O., P.M.O.E.A; Dr. Andrew Balfour, Director Wellcome Research Laboratories, Khartoum; a British medical officer, Egyptian Army, or medical inspector, Sudan Medical Department, or such members as may be hereafter appointed.

Points to be Investigated.

(1) To ascertain the distribution of various species of tsetse-flies or other biting flies in the Sudan.

(2) To ascertain if the disease at present exists in Sudan territory. If so, to determine the exact areas, and to what extent the distribution of the disease coincides with the presence of the tsetse or other flies in these areas.

(3) A systematic investigation of the blood of a population in an infected district.

(4) A thorough and complete research into the character of the disease, especially as regards its origin and spread.

DEATH OF A POPULAR DOCTOR.

The death took place, on the night of the 21st inst., of Rai Bahadur Doctor Ram Lal Chuckerburty, who, for more than a quarter of a century, was one of the leading medical practitioners in Oudh. He was much beloved, admired, and trusted by all communities. He succumbed to an attack of plague, after suffering for six days. His age was 65. He leaves behind him a widow, three sons, and three daughters. His remains were carried in a special train to Cawnpore for cremation on the banks of the Ganges.—*Pioneer Mail.*

The University of Allahabad has been directed by the Government of the United Provinces Agra and Oudh to consider the question of forming a faculty of medicine.

The Government of Bombay has appointed a mixed committee, under the presidency of the Surgeon-General with Government of Bombay (Civil Department), to investigate the prevalence of malarial and other fevers in the city. According to municipal statistics the deaths from these causes have varied from 7,513 in 1880 to 2,333 in 1903.

Personal Notes.

R.A.M.C.

The following officers of the R.A.M.C. are to command the Station Hospitals named: Lieutenant-Colonel S. G. Allen, Kalabagh; Lieutenant-Colonel R. G. Hanley, Kaldanna; Major O. R. A. Julian, C.M.G., Cherat; Major R. Holyoake, Solon; Major G. Scott, Gharial; Major T. W. Gibbard, Barian Camp; Captain F. S. Walker, Khyra Gali and medical charge of the School of Musketry, Changla Gali; Captain H. W. Long, Upper Topa; Lieutenant J. A. Turnbull, Khanspur; Lieutenant A. W. Gater, Ghora Dhaka: Lieutenant S. M. W. Meadows, Cliffden; Lieutenant R. H. L. Corduer, Hara Gali; Lieutenant H. T. M. Wilson, Lower Topa.

INDIAN MEDICAL SERVICE.

India Office: Arrivals, &c., of Medical Officers; Reported in London during April.—Lieutenant-Colonel J. B. Gibbons, Captain J. B. Christian, Captain S. Evans, Captain L. Reynolds, Captain A. W. C. Young, Lieutenant-Colonel R. H. Charles, Lieutenant-Colonel P. D. Pank, Major L. F. Childe, Major F. G. Maidment, Captain H. M. Cruddas, Captain H. W. Illius, Captain F. N. White, Lieutenant G. F. Harkness.

Nursing Sisters.—Miss B. Crane, Miss D. L. T. Moore.

Extensions of Leave.—Major H. E. Drake Brockman, 6 m.; Captain W. Lapsley, 3 m.; Professor Haffkine, 6 m.; Major J. G. Jordan, study leave, 3 m. 25 d.; Major H. Austin-Smith, study leave, 1 m.; Major G. F. W. Ewens, study leave, 8 m.; Captain R. E. J. Lester, 5 m.; Major E. V. Hugo, to July 2nd; Major J. Stodart, 5 d.; Captain H. H. Brown, 6 m.

Permitted to Return to Duty.—Captain V. B. Bennett, Lieutenant E. C. Hodgson, Major E. Hugo, Lieutenant-Colonel J. A. Cunningham, Major J. Stodart, Surgeon-General W. L. Gubbins, A.M.S.

Postings.

Captain Battye, I.M.S., acts as Consul-General, Meshed, during the absence of Major Sykes, I.S.C.

Major Duke, Civil Surgeon, Bikanir.

Major Robinson, Residency Surgeon, Jaipur.

Major G. B. Hunter, services lent, Punjab Jail Department.

Lieutenant-Colonel R. E. S. Davis officiates as Inspector-General, Prisons, Burmah.

Major J. P. Penny officiates as Civil Surgeon, Rangoon.

Captain E. R. Rost to charge of Plague Hospital, Rangoon.

Captain W. V. Coppinger officiates as Civil Surgeon, Mymensingh.

Lieutenant A. D. White holds additional Civil Medical Charge of Buxa Duar.

Lieutenant-Colonel W. A. Quaile, Civil Surgeon, Jubbulpur.

Major A. G. Hendley, Civil Surgeon and Superintendent Jail, Sangor.

Major B. R. Chatterton officiates as Surgeon Superintendent, Presidency, General Hospital, Calcutta.

Major J. G. Gordon, Civil Surgeon, Chittagong.

Captain C. G. Seymour officiates as Civil Surgeon, Cachar.

Major D. R. Green, Civil Surgeon, Khasi and Jantia Hills.

Major C. Milne, Civil Surgeon, Fyzabad.

Lieutenant-Colonel T. R. Mulroney, Civil Surgeon, Karnal.

Captain T. G. Stokes, for the season to Pachmari.

Captain C. G. Seymour to Civil employ, Eastern Bengal and Assam (temporary).

Major Bird officiates as Professor of Surgery, Calcutta.

Captain J. R. Tyrell has been placed on plague duty in Ajmir-Merwara.

Captain E. D. Greig has been placed on special duty in Central Research Laboratory, Kasauli.

The following I.M.S. officers have been granted leave:—

Major R. G. Turner (furlough, privilege, and study leave), 17 m. 17 d., from April 10th.

Major J. Chaylor White (privilege and urgent private), 6 m., from March 30th.

Major G. M. Smith (privilege and furlough), 16 m.

Lieutenant-Colonel J. R. Adie (study), 6 m.

Lieutenant-Colonel Charles, Professor Surgery, Calcutta, furlough, 12 m.

Major Green, Civil Surgeon, Muzaffarpur (furlough), 2 y.

Captain A. Moorhead (combined leave), 8 m.

Captain H. Illius (general leave in India), 1 y.

Captain Wilson (combined and study), 18 m.

Captain H. Hamilton, C.B. (privilege leave), 90 d.
Captain A. Leventon (combined leave), 20 m. 18 d.
Major C. R. M. Green (combined leave), 2 y.
Major G. W. F. Braide (combined leave), 7 m.
Captain R. P. Wilson (combined and study leave), 18 m.
I.M.S. Retirements. — Lieutenant-Colonel Banerjee, Lieutenant-Colonel J. A. Dalal, Lieutenant-Colonel H. Mariett.

Prescriptions.

FOR FACIAL NEURALGIA.

℞ Butyl-chloral	...	...	gr. 3 to 5.
Tinct. gelsemium	...	...	♏ 5 to 10.
Glycerini	...	...	♏ xxx.
Aq. anethi	...	...	ad ʒss.

For one dose. Repeat at required intervals. (Suggested by W. H. Wynn.)

TO PREVENT INTESTINAL FERMENTATION.

℞. Careful dieting, and calomel thrice daily in doses of $\frac{1}{40}$ to $\frac{1}{20}$ grain. (W. H. Wynn.)

ACUTE DYSENTERY.

R. J. Windle recommends :—

No. 1.

℞ Chloral hydrat.	...	...	grs. xx.-xxx.
Liq. opii. sed.	...	...	♏xx.
Aq. ad.	...	...	ʒi.
Syrup. aurant.	...	...	ʒii.

No. 2.

℞ Pulv. ipecac.	...	...	grs. xx.-xxx.
Aq. chloroformi	...	...	ʒi.
Mucilag. tragacanth.		...	q. s.

No. 2 is given ten to fifteen minutes after No. 1.

URTICARIA.

To allay itching apply :—

℞ Acid. thymic	...	...	grs. xv.
Acid. carbolic	...	...	grs. xxx.
Menthol	...	...	grs. iv.
Eau de Cologne Sp. camphor	...	...	āā ʒ iijss.

—*Progrès Médical.*

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Münchener Med. Wochenshrift," January 2, 1906.

Although antivenin is always used in Austria in cases of snake-bites by vipers, in Austria a ready means of treatment is described as follows: Application of a tourniquet, an elastic constriction is applied on the proximal side of the bite, and 20 cc. to 30 cc. of a 1 in 22 solution of chlorinated lime in water is injected into and round the seat of the bite. This treatment seems to be efficacious.

"Journal American Med. Association," March 10, 1906.

THE DIBOTHRIOCEPHALUS LATUS (THE BROAD TAPEWORM IN MINNESOTA, U.S.A.)

Nickerson, S. D., reports a case of infection by the broad tapeworm, occurring in a patient resident in Minnesota. Hitherto such cases were believed to be importations from Northern Europe, and the case described by Nickerson was in a child of 3 years of age, born in Minnesota of Finnish parents, of whom the father was known to have suffered from the worm.

Infection by the broad tapeworm occurs through the injection of the larvæ (plerocercoid) embedded in the flesh of certain fresh-water fishes. As fresh-water fish are not imported into America from Finland, the conclusion seems to be that some native American fish must harbour the larvæ. Moreover, it has been proved that infection of American fish by the larvæ of Dibothriocephalus is possible, and it only requires the arrival of an infected adult population from districts (Finland, Scandinavia, Poland or North Germany) where the disease is prevalent, to understand how the eggs and larvæ can travel by the sewers into inland fresh-water lakes or streams, and so infect the fish. As however, it is only when fresh-water fish are eaten raw, or partially cooked, that the disease can be conveyed, it is difficult to understand how human beings become infected, although domestic animals, such as cats and dogs, would be liable to harbour the parasite.

"Le Caducée," March 3, 1906.

"Cutaneous Eruptions of Malarial Origin, and What they Foretell" (Les éruptions cutanées du paludisme ; conséquences à en tirer au point de vue des manifestations de cette affection). By Surgeon-Major Claude.

As in the case of the majority of intoxications and of general diseases, malaria has also its cutaneous manifestations. Dr. Billet was one of the first to describe them, and as his observations on malarial febrile erythema were all supported by an analysis of the blood of the patients their origin is undeniable. Dr. Coste, who is in charge of the military hospital at Arzew, has also quite recently made a study of the cases of dermatitis of malarial origin which absolutely resemble, by their eruptive characteristics, the rash of measles. Malarial urticaria has been noted by Lespinasse in the Sudan; Vacari has also observed several forms of it.

Surgeon-General Moty attributes to malarial infection certain cases of cutaneous gangrene, closely allied to urticaria, which he accounts for as follows: Obstruction of the capillaries by pigmented leucocytes, want of nutrition induced thereby, and necrosis of the tissues.

An analysis of the blood should always, therefore, be made to confirm the truth of their malarial origin, but this for many reasons is not always practicable in malarial climates ; microscopes are not always ready to hand, and their carriage offers many difficulties. In any case, cutaneous manifestations, generally of a febrile character, should always, when they occur in a tropical or marshy district, be considered as possibly malarial in origin. But we, for our own part, are of an opinion that they have also an importance as forerunners of further phenomena ; they may, indeed, be premonitory of a severe, and even very dangerous, attack of acute malaria ; in chronic malaria, on the other hand, the eruptions seem to foretell, at an early date, a return of a true febrile attack, similar in all respects to the acute form of ague.

The following notes leave no doubt in this respect; they have been condensed, and only the main facts are here recorded :—

(1) Mrs. X., a recent arrival at S., a very malarial spot in the province of Oran, was laid up in August, 1904, with an acute attack of ague. One of these attacks was accompanied by an erythematous eruption over the body generally, extending in patches even to the face ; the fever subsequently took on a continued type. Suddenly, attacks of hæmoglobinuria developed, the eruption disappeared, and death took place on the fifth day.

(2) Zouave, N., stationed at S. for several months, has never had ague ; in September, 1903, he was admitted to hospital with acute malaria. Whilst in hospital he developed shingles on the left side of his chest. The next day he was seized with a pernicious attack. The patient died in a few hours, in spite of injections of quinine, &c.

(3) S. (of Spanish extraction) was admitted to hospital at

Daya in August, 1903, with acute ague. During an attack an erythematous rash appeared on his trunk and face. As delirium set in, he was taken back to his house by his friends. The eruption ceased the same day that he returned. The patient died the next day in convulsions in spite of all care.

The rapidity with which all these three cases of cutaneous manifestations were followed by a fatal termination is truly worthy of note. Fortunately, in chronic malarial patients the eruptive manifestations do not appear to be of such serious import; this statement is borne out by the following cases :—

(1) X., an army surgeon, since his return to France from Algeria, has suffered from several malarial attacks, which were more frequent than when he was abroad; at times he suffers from a severe pain in the regions of the left brachial and cervical plexuses. One evening he was suddenly seized with an attack of urticarial eruption, limited to both hands and both forearms; there was an unbearable itching for two days, then the uticarial rash disappeared, but the patches of skin seemed as if wine-stained. All these symptoms disappeared, but X. was seized with a true fit of ague, with all its three stages. Three months later the same symptoms were repeated in an identical manner. Quinine had but little effect either on the rash or the attacks of ague which followed them.

(2) Captain N., of the 3rd Zouaves, stationed in France for the last year, was seized one evening in March, 1905, with general prurigo, also with urticarial patches on the upper limbs and on the neck. He consulted the surgeon on duty and informed him that, in consequence of this manifestation, he would suffer in a few hours from a long and sharp attack of ague. True enough, ten hours later the premonitory rigor commenced. The attack was followed by prostration which lasted four days. This officer stated that this was always the case after the urticarial attacks, whilst when there was no eruption he was always able to return to his work immediately after the ague fit was over.

(3 and 4) Two similar cases to the above in non-commissioned officers were also recorded; these were both old malarial subjects.

It would, therefore appear that the following conclusions may be applicable in all cases of malarial intoxication of whatever date :—

(1) All cutaneous manifestations occurring in a malarial subject would appear to foretell a more or less serious relapse.

(2) With a view to meeting the gravity of this relapse, all therapeutical means should be employed immediately on the onset of the eruption, although in all our own cases they appeared to us to be of little effect; but further trials might be made in this respect.

"Verhandlungen der Deutsch. Zoolog. Gesellschaft," 1905, p. 16.

ON THE FECUNDATION OF THE PROTOZOA.

Schaudinn emphasises the modern view of the nuclear dimorphism of these organisms, concluding that "in all protozoa, whose cycle of evolution and fecundation is known, a dualism of the somatic and reproductive nuclear constituents may be recognised at some stage of development." Applying these ideas to the complicated structure of trypanosomes, and especially to that of *Trypanosoma noctuæ*, he identifies the flagellar apparatus of a trypanosome as equivalent to the macro-nucleus or vegetative nucleus of an infusorian, but does not include the smaller nucleus or blepheroplast with the flagellum in this homology.

The two chromatin masses of the trypanosome, *i.e.*, the nucleus proper and the blepheroplast, are for him the equivalent of the infusorian micro-nucleus, both being, he points out, mainly formed of reproductive elements. In the process of evolution, the large nucleus throws off its vegetative elements in the form of chromatin, while the small nucleus develops the locomotive apparatus, so that the two combined represent the primitive element of the infusorian; and Schaudinn concludes that the trypanosomes exhibit a double nuclear dimorphism.

It may be remembered that Schaudinn divides the oökinets of *Halteridiun noctuæ*, which develop in the mosquito into trypanosomes, into male, female, and indifferent forms. The female forms are large with a big nucleus, and the locomotive apparatus and blepheroplast but little developed. The male forms, on the other hand, are small with small nucleus, and large locomotive parts and blepheroplast. He thinks, therefore, that the large nucleus contains mainly male, and the blepheroplast female elements.

This sexual distinction originates in the earliest development of the oökinets. In all there is a division of the nucleus of copulation into a large and small nucleus, the former aborting in the males, and the latter in the females, while in the intermediate forms both persist. He emphasises the peculiarities of copulation in *T. noctuæ*—quantitative and qualitative nuclear reduction (expulsion of male and female substances, and reduction of the number of chromosomes to one-half; persistence of male and female centrosomes; and independent unions, two and two of the male nuclear elements of the male with the female nuclear elements of the female.—(Trans. of F. Mesnil's abstract in the *Bulletin de l'Institut Pasteur.*)

"Transactions of the Liverpool Biological Society," 1905, p. 278.

FISH PARASITES.

Johnstone, J., describes a considerable number of trematodes, cestodes, an *echinorhynchus* and a sporozoan from a number of common edible fishes, and his paper has necessarily a comparative interest for all engaged in the study of helminthology.

"Atti. R. Accad. Lincei de Roma," 1905, p. 411.

CUTANEOUS INFECTION BY ANCHYLOSTOMUM.

Pieri, Leno, concludes that man is infected either by swallowing the mature larvæ of (or by penetrating the skin) the *Uncinaria americana* as well as *U. duodenalis*, being both capable of infecting man by either route. The same remark applies also to *Dochmius trigonocephalus* and *D. stenocephalus* of the dog, but in this animal infection by penetration of the skin is the more efficient route of infection.

"C. B. Acad. des Sciences," cxii., p. 1204.

IDENTITY OF SURRA AND MBORI.

Laveran, Prof. Experiments conducted by Vallée and Panisset show that bovines immune to the surra of Mauritius are also so against mbori, the trypanosomiasis of dromedaries in Timbuctoo. M. Laveran now shows that, conversely, a goat immune to mbori is also so to Mauritius surra, thus placing the identity of these diseases beyond question.

"Centralblatt f. Bakter.," I., Origin, 1905, p. 43.

SPREAD OF PLAGUE THROUGH THE AGENCY OF INSECTS.

Hunter, W., of Hong Kong, points out that insects have long been suspected as possible vehicles of plague infection. For example, in 1498, Archbishop Knud wrote that the approach of plague is heralded by a change of weather with thick fogs and the appearance of swarms of flies. He discusses at length the potentialities of flies, mosquitoes, lice, fleas, and cockroaches in this respect, and the organs of these insects in which the virus may be carried; and the mechanism of infection by the fouling of clothing, food, &c., or by biting. His conclusion is that insects are actually capable of transporting plague to long distances, but that there is little to choose between biting and non-biting insects in this connection, as he believes that the danger of bites from insects that have been on plague patients is greatly exaggerated, and that the really important point is that many insects are capable of infecting food, clothing, and furniture of all sorts.

EXPERIMENTS ON THE TREATMENT OF TRYPANOSOMIASIS BY MEANS OF ANILINE COLOURS.

These experiments form the subject of an inaugural dissertation by Ewald Franke, and were conducted under the superintendence of Prof. Erlich, who himself, in conjunction with Shiga, had already made some experiments with a a dye called trypanroth. An injection of this dye appears to cure mice infected with "caderas," and Franke now finds that immunity lasts for twenty-one days after the cure. Neither malachite green nor ethyl green proved as effective as trypanroth. Even better, is a combination of arsenic and trypanroth suggested by Laveran.

Franke also cured a monkey (*Cercopithecus callitrichus*) by a combination of arsenic and another dye which he merely speaks of as being "near" trypanroth. The serum of this monkey was also proved to possess parasiticide and agglutinating powers.

"Indian Medical Gazette," April, 1906.

TEN DAYS' PIGMENTARY FEVER OF BENGAL.

Cobb, Lieut.-Colonel R., says: This form of the indeterminate fever of India occurs during the hotter part of the year, and is characterised by "continued fever," lasting from eight to ten days, and the presence of a peculiar pigmentation of the face which follows the febrile attack. It usually seems to occur in persons who have been exposed to great heat, and the onset appears to closely resemble an attack of influenza, apart from the more usual catarrhal symptoms of the latter. The pigmentation is "bat-shaped," taking the same form as the eruption of lupus erythematous. No parasites are found in the blood, nor is the liver or spleen affected. A detailed account of a typical case and short notes of twenty-nine others are given by way of illustration.

This is an interesting instance of the differentiation of a class of cases that undoubtedly, till lately, would have been put down to the credit, or rather discredit, of malaria.

"Bull. de l'Institut Pasteur," T. 4, p. 241.

Summary of papers presented to the Annual Meeting of the Society of American Bacteriologists at the University of Michigan.

Norris, Pappenheimer and Flourney, preliminary communication on the infection of white rats with spirochætes, and on the multiplication of the latter in a liquid medium.

With the blood of a case of relapsing fever they succeeded in infecting both monkeys and white rats. The latter when infected by subcutaneous inoculation showed more or less numerous spirochætes in their peripheral blood for the next two or three days, and these persisted from one to three days. Beyond splenic engorgement, the rats did not seem ill, and there were no relapses. They succeeded in as many as twenty-five serial infections, and the infected rats acquired immunity, but though their serum, mixed with infective blood, retarded the evolution of the spirochætes, it was useless when injected a few days before. The authors observed nothing indicative of longitudinal division, and believe that proliferation takes place transversely, and that the spirochætes are really nearer to the bacteria than to the protozoa; nor could they find any sign of either cilia or undulating membrane. The spirochætes in a small quantity of infective blood added to citrated human or rat blood multiplied considerably, and this could be repeated once, but no more. Citrated infective blood retained its infectivity for six hours at the temperature of the laboratory.

TRYPANOSOMES OF MOSQUITOES.

Novy, F. G., MacNeal, W. J., and Torrey, H. N., of the University of Michigan. As the result of their work on the cultivation of the trypanosomes of birds, the authors maintain that the flagellates observed by Schaudinn in mosquitoes are not, as the latter thinks, evolutionary stages of the endoglobular parasites of the birds, but cultivations *in vivo* of trypanosomes present in the blood of the birds experimented with. They, therefore, try to show that trypanosomata can live and multiply in the intestine of mosquitoes under forms corresponding with those which can be got *in vitro*.

Mosquitoes (800) were caught and fed on animals ascertained to be free from hæmatozoa. The intestines of 15 per cent. of the mosquitoes contained flagellates, the lumen of the intestine in some being quite obstructed with masses of rosettes of flagellates with the flagellæ in the centre. Several different trypanosomes were found, *Crithidia fasiculata* and a form perhaps identical with *Herpetomonas subulata* being the commonest. Owing to the presence of bacteria, cultivation of these flagellates was difficult, but the *Herpetomonas* was isolated in company with a small coccus and the *Crithedia* together with a yeast; and these cultivations remained for six months in the laboratory, while in the others the flagellates were crowded out by the bacteria. These cultural forms are identical with those of the mosquitoes, *e.g.*, the blepheroplast is always in front of the nucleus and, under both conditions, the *Herpetomonas* has two characteristic diplosomes in the hinder part of the body.

The results of inoculations of animals with the cultures were negative. When mosquitoes are fed with *Trypanosoma brucei* or *T. lewisi*, these parasites persist for more than twenty-four hours in the intestine of the mosquito, and retain their infectiveness for rats. The authors believe, therefore, that the trypanosomes found in the stomachs of tsetse-flies, fleas, &c., are really cultural forms, the blepheroplast being in front of the nucleus. They conclude, therefore: (1) That these forms can be cultivated in test tubes; (2) that the herpetonads found in flies and mosquitoes are really cultural trypanosomes, and that further researches will demonstrate the hæmatozoa, from which they originate; (3) The *Crithidia*, on the other hand, have no undulatory membrane, and for the present may be taken to represent a distinct genus.

Novy, E. G., and Knapp, R. S., describe a method of isolating trypanosomes from accompanying bacteria.

"Ann. Inst. Pasteur," December 12, 1905.

Emile-Weill, P., details various attempts to cultivate the *Bacillus lepræ* in a variety of media, and comes to the conclusion that success depends on the presence of human tissue elements included in the leproma, as in only two instances of cultivations on yolk of egg did the bacilli survive after having digested those cells.

"C. R. Soc. Biologie," T. lx., p. 291.

Sergerit, Edm. and Et., describe, under the name *Herpetomonas algeriense*, a flagellate often found in the intestine of *Culex pipiens* and *Stegomyia fasciata*, bred in the laboratory at Algiers. In its motile form it has an elongated, pyriform body, with a flagellum, which arises from a centrosome placed behind the nucleus. Besides these there are spherical motionless forms with long flagella.

Besides these they have found in an old preparation made in 1901 from the intestine of *Anopheles maculipennis* another flagellate, with a very long fusiform body, pointed behind and rounded in front, with a long lash, which resembles *Herpetomonas jaculum*, discovered by Leger. The same preparation also contained a number of spirochætes.

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Original Communications.

THE PURU OF THE MALAY PENINSULA.

By T. D. GIMLETTE, M.D.

Awarded a Craggs' Research Prize, 1905,

London School of Tropical Medicine.

A DISEASE known by the Malay name of puru has never been described in detail from the Malay Native States before, and although it is very common among Malays, nearly all our information concerning it has hitherto come from the group of islands which forms the Malay Archipelago.

This wholly unmerited neglect by residents on the mainland in the description of puru has probably been partly due to the tardy exploration of this part of Further India, which was only commenced lately [1], partly to the natural reticence of the natives and the suspicion with which the Malay peasantry regarded the prying eye of Western medical science, but chiefly to want of independent medical observers with time and opportunity for special investigation.

Until quite recently the prevalence of puru in British Malaya seems to have even escaped the attention of the Federated Malay States Government, but this, again, is probably owing to the fact that the disease does not interfere much with labour, which is mainly carried on by Chinese, and, speaking generally, because it does not permanently injure the health of the Malay to any extent. The natural tendency of the disease is towards spontaneous cure. Death from puru is unusual; it is seldom fatal, unless during very early childhood or in advanced old age.

A period of seven years' service in the Government of the Federated Malay States, spent in the States of Pahang, Selangor, and Perak, has given me experience of puru, and a further residence of over two years in Kelantan, a Malay State hitherto unexplored by students of tropical medicine, and one in which this disease is most prevalent, has afforded me an unusual opportunity for observing it under purely native conditions. My contention is that the puru of the Malay peninsula is identical with the West Indian and African yaws and the Fijian coko, and that it has no real relationship with syphilis.

THE HISTORY OF PURU.

The earliest references which can be taken as bearing upon puru are by Bontius in 1718, who seems to have recognised it in the Molucca Islands as the amboina pocks [2], and by Marsden, who mentioned a native disease called nambi in his "History of Sumatra" (1811) [3].

Many years later, Charlouis, who described frambœsia from Java as polypapilloma tropicum [4], gave one of the local native names as nambie. But up till now (1886) even Hirsch had been led from want of records to assume that the mainland of Further India had been little, if at all, visited by frambœsia or yaws [5]. Ten years later a definite outbreak was reported from Assam [6], and yaws has quite recently been described as being very common in Siam [7].

In 1893, Dr. Brown described puru from Penang as lupus contagiosus malayorum [8], and in an annotation on this important paper, Dr. T. Colcott Fox drew attention to the similarity of puru to yaws, but finally concluded that puru was the same as Oriental sore, and in 1897 the name was given as a synonym of that disease in Allbutt's "System of Medicine" [9]. It has since been shown that the appearance of some true Oriental or Delhi sores is by no means so characteristic as one would expect it to be from descriptions given in books [10].

Dr. Barker, of the Sarawak Civil Service, was the first to identify puru with yaws from Kuching in 1898 [11], and Dr. Connolly, of the Federated Malay States Civil Service, wrote a valuable memorandum in the same year, on the occurrence of yaws in Kinta, a district in the Federated Malay States [12]. Puru is given as a synonym of yaws in Scheube's "Diseases of Warm Countries" [19] (1903), and Dr. George Pernet (1904) has mentioned the puru of the Malay States under the heading of yaws [13], as well as Dr. C. W. Daniels, the Director, Institute for Medical Research, Federated Malay States, who has included it among the commoner diseases of Malays [14]; but with these important exceptions there are few, if any, direct references to the prevalence of the disease in the Malay peninsula.

THE ETIOLOGY OF PURU.

The true infective agent of the disease has not yet been recognised, and in a review of the etiology of puru, little or no support can be relied upon from any in-patient hospital statistics. Cases either under the name of puru or of yaws are seldom included in the returns of the Federated Malay States hospitals. The reason is that although the Malay native attends readily as an out-patient at any convenient and charitable dispensary, or possibly clamours for medicine on the visit of a European to his village, yet, notwithstanding the many opportunities for further improvement offered by European hospital treatment, the peasant fails to this day to be attracted by the benefit of treatment in a hospital ward, and generally applies for admission in a spirit of tolerant curiosity and in a desultory fashion, which is merely the effect of a momentary enthusiasm or the result of a personal attachment.

Under these circumstances it is impossible to collect hospital statistics which are of any great value. There is no medical literature. The only knowledge is that of the individual. The Malay medicine man (bomor) and the witch doctor (pawang) is for the most part but a native magician or a veteran wiseacre. They say naively that puru (literally a sore), like small-pox, comes from the smoke of hell fire! I have obtained, however, a good deal of general information from these native physicians.

Age.—Puru is one of the most common diseases of Malay children, but it is rare among infants; and it is, I think, seldom seen as early as the eighth month of life.

It is common to find puru in almost any Malay village (kampong) among little children who—although probably still at the breast—are able to walk alone and are exposed to contagion. The disease is not, however, confined to children, and may occur at any

age, except at birth. Out of fifty individual cases noted in the out-patient registers of the Duff Development Company's hospital at Kuala Lebir in the interior of Kelantan (from July, 1903, to July, 1905), twenty-four were children whose ages ranged from four to twelve years. The others were all adults who applied for relief mostly during the first year of the establishment of the hospital (1903), suffering from the later manifestations of puru of the foot.

Sex.—Puru appears to attack either sex with equal frequency, but in adults lesions of the foot are more common among males.

There is a variety called puru kochi (literally, Cochin China sore), which is said by Malays to attack the genital organs only, and to be more common among the female sex, but not necessarily confined to women. Dr. C. W. Daniels has suggested to me the possibility of puru kochi being akin to sclerotising granuloma of the pudenda. It is rare, and has not yet come under my personal observation.

Race.—The permanent native population suffers out of all proportion to the many inhabitants of the native states of the Malay peninsula. It is no exaggeration to say that at least 90 per cent. of the Malays in Kelantan are attacked by puru. Europeans appear to be exempt, but I have seen it among Chinese, Javanese, Siamese, and more rarely in Sikh and Dyak settlers. In the Federated Malay States it appears to me to be uncommon among Tamil immigrant children. I have seen it among the wild aboriginal inhabitants (Sakui-Semang) of Kelantan. It is common among them, and in the Kuala Lebir district is known in their dialect by the name of "choh."

Heredity. — In this disease heredity has apparently no influence. Children are never born with puru, even if one or both of their parents suffer from the disease at the same time. Puru is never seen during the forty days of the Malay puerperal state. There is no evidence, in fact, of congenital puru among Malays, who hold that the disease is always acquired. Abortions as the result of puru are almost unknown, unless during a very severe attack. Intermarriage and consanguinity do not seem to have any influence. Among hereditary antecedents there are no diseases from which Malays commonly suffer which seem to have any relation to the etiology. Tuberculosis is, I think, on the whole, as infrequent as leprosy among the country people. Lupus appears to be unusual in the Federated Malay States.

Physical Geography.— The Malay peninsula lies between the Straits of Malacca on the west and the China Sea on the east. It is made up of a number of native states, which are divided into eastern and western by a range of mountains which runs like a backbone nearly through its entire length. The height of the various peaks of the range varies from 3,000 to over 7,000 feet above sea-level.

The most important of these states are under British protection. They are the States of Perak, Selangor, Pahang, and Negri Sembilan, which were confederated in 1897, and have since been known as the Federated Malay States. They are situated in the centre of the Malay peninsula, and are bounded on the north and north-east by Province Wellesley and the Malay States of Kedah, Patani, Kelantan, and Trengganu; on the south by Malacca and the State of Johore; and on the east and west by the China Sea and the Straits of Malacca respectively.

The population of the Federated Malay States numbers approximately 665,000 persons.

Kelantan is the most important of the other Malay states. It approaches Siam, being between lat. 5° 40′, and 6° 20′, north. It is bounded on the north by the Malay Straits of Legeh and Patani—dependencies of Siam adjoining Singgora, the southernmost point of the kingdom of Siam.

Climate.—The Malay climate is hot, moist, and very equable, making the peninsula a hotbed for fostering parasitic diseases of the skin, especially tinea imbricata, which is indigenous among many others. The average mean temperature in the shade may be said to be—maximum from 85·0° F. to 88·0° F., and minimum from 70·0° F. to 72·0° F. The highest maximum may be taken at 96·0° F., and the lowest at 68·0° F. The rainfall is large ; over 100 inches per annum is the rule in most Malay states. Any division between wet and dry seasons for the year is very indefinite.

Geographical Extension.—As regards the Malay peninsula, puru is probably universal, although it may be more common in some places than in others. It occurs in all the states of the Federation, especially in Pahang, and is very prevalent in Kedah and Kelantan. It has been observed as far north as Legeh and Patani. In Trengganu puru is said to be even more abhorred than small-pox, on account of its persistent and chronic nature.

Hygiene.—The personal hygiene of the Malays is good. Country people bathe at least twice a day, but there is often much to be desired in the cleanliness of their attire. Children at the age at which puru is common wear little or no clothing.

Social position has probably no influence at all as a predisposing cause of puru among Malays. In Kelantan it is as common in the dwellings which form the native palaces as among the cluster of huts which make up the smallest hamlets. His Highness the Rajah of Kelantan, for example, has suffered from puru as a child, and the princes frequently contract puru.

The hygienic conditions of Malay life are similar, however, both in the high-born and in the low-born native as regards house accommodation. The sanitary condition of nearly all their houses is bad, and, although they are raised from the ground, they are ill-drained, ill-lighted, ill-ventilated and ill-cleaned. The daily household slops (mostly dirty liquid refuse from cooking) are thrown through loose bamboo floorings and allowed to soak into the ground beneath, so as to form a permanent slush under the kitchens. On the other hand, in the rural districts, where for the most part puru is very prevalent, it is very often common for natives to dwell upon bamboo rafts, which are made in the form of house-boats. The mass of the Malays, in fact, live either on rafts or in comparatively small huts built along the banks of the rivers. The Malay states are well watered by innumerable rivers and streams, and it is fortunately seldom necessary, therefore, to store water in this part of the East.

The only instance of the bad effect of stored water

in the Federated Malay States is, I believe, an epidemic of zinc poisoning which occurred in Pahang in 1900 among a half company of Sikh soldiers, which might have been attributed to the climatic effect on the corrugated iron roof from which a supply of rain-water was derived [18].

Preceding Illness.—At first sight puru apparently possesses an analogy to syphilis, but it is never thought by Malays that there is any affinity between these two diseases. There are many specific characters by which to distinguish them. Neither is a protection from the other, nor do they vary in inverse ratio. It is only a previous attack of puru that protects the individual from a recurrence of puru.

It is fitting to mention here that—making due allowance for many errors in the definitions of Malay nosology—many of the manifestations of venereal disease, as it occurs among dark races in warm climates, are well known to Malays.

Gonorrhœa is generally known in Malay as sakit kenching (lit. sakit, sick, and kenching, urine), or as karang.

Venereal buboes are referred to in many states as mangga, which literally means a mango. Curiously enough, the Chinese also call them suai or mangoes. Syphilis is known in Kelantan as seduwan or seduwan sundal (seduwan, a bad disorder; sundal, a bare-faced harlot), or in other places as sakit prempuan (prem-puan, a woman). Three stages of seduwan sundal are recognised: (1) The original manifestation in man or woman on the genital organs; this is followed by (2) seduwan bunga (bunga, lit. a flower or pattern on anything), which attacks the gums and face, and is supposed by Malays to be due to infection (uwap, lit. vapour or steam); and (3) seduwan angin (angin, lit. wind), which especially affects the joints and bones.

The term stong or restang is commonly applied to destructive ulceration of the nose, such as occurs in tertiary syphilis. These diseases are all of common occurrence.

Other Observations and some Native Ideas.—The contagion of puru is well known. Malays say that children who play about together catch it from one another, but though two or more children in the same family may contract puru at the same time it does not necessarily run through the whole family. A second attack is said never to occur in the same person. Many hold that a kind of immunity is established in later life by the occurrence of the eruption in a rotation of three crops before the age of 3 years.

Isolation is never thought of, but natives avoid contact with the discharges of puru, and do not care to eat with people who may be afflicted with the general eruption. It is thought to be unwise to bathe immediately below any one suffering from puru of any kind, and many Malays are careful to bathe up stream, or away from people who are engaged in washing their sores or those of their sick children at the time.

Deliberate inoculation is never practised among them. The attack frequently follows on some slight scratch or abrasion, but it is said that the sores of the Malay kudis (lit. scurf), a kind of generic name given to ulcers as well as to scabies, or kudis gatal (gatal, to itch), and other sores of like appearance, are liable, on occasion, to take on the characters of puru sores. Leech-bites, although very common in jungle districts, do not receive much attention in this connection, but there is a belief among some Malays that the sores caused by contact with the fresh "getah," or live sap of a common fruit tree called in Malay pokoh machang (the horse mango, *Magnifera fœtida*), is a ready vehicle for inoculation by puru should there happen to be cases in the neighbourhood.

Sores on the lips and about the mouths of children may often be caused by eating the acrid fruit of this wild mango. The juice of the durian blossom (*Durio zibethinus*, L. Malvaceæ) is also blamed in the same way. These trees, however, are seldom avoided in consequence. Puru is well known to attack people both before and after they have suffered from small-pox. Small-pox is common in the uncivilised states, and educated Malays in the Federated Malay States often attribute the decline of puru (in Selangor, for example), as well as the apparent immunity of Europeans and their children, to the fact that, as a rule, all European residents and their children are more or less well vaccinated in childhood. Malay children, however, who have been well vaccinated readily contract puru, and it is more practical to account for the apparent immunity of Europeans and their children by explaining that they are not very much exposed to the contagion of puru.

It would be exceptional for European children to have many native playmates in places where puru was common. As a matter of fact, most Europeans, by reason of the refining influence of civilisation, are reluctant to come into personal contact with the loathsome-looking sores of puru. The advance of civilisation among the Malays in this respect, together with the influence of modern sanitation, should tend towards the check of the disease. In the civilised states of Selangor and Perak puru used to be far more common in the towns than it is at present.

Malays do not appear to associate the idea of flies or insects being possible agents in spreading puru, and although their expression, "bagi lalat chari puru" (as the fly seeks the sore), is used in conversation, it is applied more in the sense of the English saying, "Where the carcase is there will the eagles be gathered together." The common house-fly (*Musca domestica*) is not very prevalent.

Malays live rather poorly, the peasants mostly on boiled rice and dry salted fish, but diet does not appear to have much influence in the causation of puru. Native settlers, especially Chinese, favour a far more liberal diet.

In Kelantan, the practice of eating a home-made condiment of badly preserved sea-fish is very common. It is made by pounding two kinds of small fish (in Malay, bilis and kikih), salting them, and adding a little water. The young fish are chosen, and the raw preparation is kept for forty days, and when in a state of decomposition is ready to be eaten with rice. It is called "budu" and "peda" in Pahang. Dr. Hanitsch, the Curator of Raffles Museum, Singapore, has kindly identified these fishes for me. The larger of the two, ikan kikih, is *Equla edentula*, which is distributed in the Red Sea, Seas of India, Malay Archipelago and beyond. The smaller, ikan bilis (lit., ikan, a fish), is *Engraulis indicus*. It is very common about Singa-

pore, belonging to the family *Clupeidæ*, which comprises herrings and sardines.

Some Malays in Kelantan attribute the prevalence of puru in this state to the comparatively large amount of budu which is consumed by Kelantan Malays. The custom, however, seems to be peculiar to the eastern and northern states and to be in no way responsible for the origin of puru.

In Kelantan a very widespread and fatal disease occurs among fowls. It is characterised by an eruption about the beak and eyes, often leading to blindness. I have not, however, been able to trace any clinical resemblance between it and puru as it occurs in human beings.

The Clinical Characters of Puru.

Puru is universally recognised by Malays as being a specific disease. They have carefully observed the constant groupings of its symptoms and have given differential terms to its various manifestations. The most prominent of the well-marked clinical characters is the appearance of the eruption of the puru sores as it occurs in Malay children.

The disease attacks otherwise healthy and robust children, and observers with any experience of puru cannot fail at sight to recognise the eruption of puru sores in Malay children owing to its constant and uniform appearance. In the later stages of the disease it is not so easy to speak so definitely nor to recognise the sequence of the symptoms.

There is a stage of incubation, efflorescence, decline and sequel, but Malay children are seldom seen during the early stages of puru. In adults, again, the eruption of sores is more likely to be seen among foreign native settlers. Malays have mostly experienced it in childhood. The incubation period is therefore difficult to determine. It is given off-hand by most Malays as being twenty days. The attack is generally preceded by an ill-defined constitutional disturbance which causes some slight fever, as well as rheumatic-like pains in the bones, back and limbs. These symptoms are occasionally delayed or suppressed through chills, and it is said that the prodromal pain in the bones is then very pronounced and the backache equal in severity to the pains of small-pox. The joints in such cases are tender and swollen quite early in the disease.

The initial puru breaks out all over the body as a miliary papular eruption (" ketut " in Malay), and often in successive crops. It is attended with great itching, so much so as to give occasion for the Malay proverb, " Orang yang puru gatal tubohnya neschaya menggaru juga kerja-nya " (A man whose body is itching with puru will always be engaged in scratching it). I doubt, however, if the itching is sufficient to keep Malays from sleeping. Children often complain of feeling chilly at this early stage of the disease; they are feverish, peevish, and disinclined to bathe. The efflorescence of puru, known in Malay as the " bunga " (a blossom), develops gradually from the primary papular eruption. The " point d'appuie " is most often at some simple scratch or small sore from which springs what is known in Malay as the " puru ibu," or mother sore. This is formed by a combination of several papules and is generally the largest sore as well as the best developed and the most persistent. It is most often found below the waist, on the foot, leg, or thigh, but it may occur on the wrist or hand. This particular clump of papules may assume a horseshoe shape, or may develop into a large sore, as in fig. 1.

Malays always fancy the " puru ibu " to be the initial sore, and they often think it is a misfortune if it should disappear early in the disease. It is often the last sore to heal. Malays also think that it is impossible to arrest the development of the " puru ibu " and so prevent puru from spreading over the body and subsequently affecting the joints.

The " bunga puru," or efflorescence of the disease, originates from the papular eruption and seems to spring up like seed planted, as it were, beneath the skin and to grow up into a crop of tubercles which gradually bursts through the skin and expands into a number of discrete lesions, which ultimately become the typical clinical features of puru. Many of the original papules, on the other hand, involute and subside. There seems to be no reason (such as irritation from scratching, &c.) for some of them to develop into puru sores while others, and perhaps the majority of them, disappear. As they develop they are moist by reason of a glairy, thin, scanty, but rather sticky discharge, and on cutaneous surfaces they gradually dry up and generally form sores which are covered with a hard, tenacious, dirty, yellowish crust. Puru sores at this stage are those which are most commonly met with. Pus, unless formed by irritation, is not as a rule found under the crusts, and in four or five instances I have found the discharge to be either alkaline or neutral to litmus paper.

The sores are scattered over the face, neck, trunk, and extremities. They are more or less disproportionate and vary very much—from a grain of maize to a betel nut, for example—in point of size. They are often flattened out, but always seemed to be indolent and insensitive. By soaking of the crust of a small and rather old typical sore the reddish and roughly granular contour of the swelling may be exposed. It is not unlike a raspberry in appearance. Multiple and typical examples may be seen in the armpits and on the penis.

Irregular-shaped sores are very common at the angles of the mouth, at and about the nostrils, on the buttocks, and about the anus and genitals. When the eruption is well out the general health is practically unaffected, particularly when the sores have dried and scabbed over. They seldom ulcerate to any extent. I have never seen them transformed into " sloughs."

The disease does not attack the viscera, so far as can be judged without the aid of *post-mortem* examinations; the nervous system and the larynx appear to be exempt. There is certainly no specific affection of the eye in puru; deep lesions of the tongue do not occur, but the sores are said to attack the mucous membrane of the mouth. I think this, however, must be rare. The symptom is known as " guwan " or " serawan " in children. It has possibly been confounded with " thrush." The occurrence of an attack of puru for the first time in old age is said to be grave.

Puru sores heal very slowly on their own accord, and when they are at last beginning to decline they

shrink and gradually disappear, leaving either dark purplish transient strains or a few dark superficial scars.

The disease is of long standing; it frequently lasts for one or two years, but often for a much longer period. Sometimes the initial papular eruption becomes scurfy ("puru sekam"), and in other cases it may develop in places into a serpiginous eruption ("puru kretas"). When the eruption comes out slowly constitutional symptoms ("senggai puru") are complained of, such as malaise, simple periostitis of the long bones, and painful swelling of the wrist, fingers, and other joints. These symptoms are not at all uncommon in adults. During the decline of the disease, reminders in the shape of tiresome sores may crop up long after the original sores have ceased to recur. This is, I think, especially noticeable with sores of the foot, which are very common in adults who have suffered from puru in childhood. They generally occur on the sole and are very painful until they have burst through the epidermis. The pain is said to be much aggravated in the bare-footed native by contact with the dung of the buffalo and chicken. In Kelantan they are especially common during the durian (the thorny fruit) season in July and August, and for that reason, I believe, are called "puru durian." These foot sores are also seen in children.

A kind of xerodermia, or keratosis of the skin, as shown on the hands in fig. 2, also occurs on the foot, and is ascribed to puru. In appearance it is like dirty parchment paper, but the dry skin frequently cracks and causes painful fissures. This must not be confounded with the common affection of the feet, known locally as "burok chelapah" (lit., burok, rotten; chelapah, soiling by the tread). It is due to walking barefoot on gravel or sand.

Although puru as a disease is liable to be very persistent and recrudescent, Malays never acknowledge any lesions of deep nature, such as nodes, chronic dactylitis, chronic arthritis, and deep ulcers, as being sequels of puru. Lesions of the kind shown in fig. 24 and Plates XXXIX. and XCI. of the New Sydenham Society's Atlas [15] are very common among Malays. I do not think, however, that in the case of the Malay peninsula one is justified in attempting to fit these facts into a clinical description of puru. They appear to me to be manifestations of syphilis.

(*To be continued.*)

THE ANATOMY OF THE BITING FLIES OF THE GENERA *STOMOXYS* AND *GLOSSINA*.

By Lieut.-Colonel G. M. Giles, I.M.S. (Rtd.).

(*Continued from p.* 102.)

The distinguishing generic characteristic of *Stomoxys* is, however, the form of the proboscis, which, though presenting a strong general resemblance to that of *Glossina*, differs so markedly in outline that it can be recognised at a glance.

The organ is shaped like a radish, with a bold curve, convex on the dorsal aspect, and is slightly swollen at the tip. With the exception of the ends of the labella, which are clothed with long thin hairs, the surface is almost nude. It is connected with the lower part of the face of the insect by means of a soft membranous piece consisting of the combined bases of the labium and maxillæ, and bears on its dorsal aspect, close to the face, the short, single-jointed

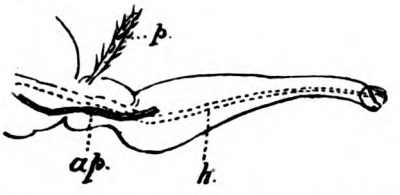

Fig. 13.—Profile outline of proboscis of Stomoxys. *p*, palp; *h*, dotted line indicating position of hypopharynx and labrum; *ap*, apodeme or sclerite which articulates with the fulcrum and serves as a jointed point of support to the proboscis. Semi-diagrammatic.

maxillary palps. This soft basal portion is about a quarter the length of the main radish-shaped part of the organ, and its length and flexibility permits of ample motion in flexion and extension, and to some extent also of protrusion and retraction, the necessary stability of the radish-like part being afforded by a pair of slender chitinous rods, the furca, which articulate with the fulcra, at their proximal ends, and distally, with the bases of the lancets.

Through the axis of this flexible basal portion runs a chitinous tube, continuous behind with the buccal cavity, and in front with the grove of the lancet, which in this insect consists of the labrum only.

Fig. 14.—Head of Stomoxys in profile.

The above rough sketch gives a fair idea of the organ in the position it is usually carried by the insect, but the basal portion is often flexed backwards almost against the base of the head, and on the other hand the trunk portion can be extended so as to almost touch the antennæ.

A glance at the profile outline below shows that it would be difficult to plan a sheath for the lancets less suited to act for itself as a piercing organ. The labella form an ostentatiously blunt extremity to the organ, and are furnished with delicate hairs and elaborate tactile organs, while the abrupt thickening of the basal four-fifths makes it clearly impossible that it should ever act as a rapid piercing organ, if, indeed, it could be in any way possible to employ it as such. No boring instrument that I know of, devised either by Nature or by man, has this form, and when, for want of a better

tool, one is driven to try to use a piece of steel of this shape as an awl, one at once finds how utterly unsuited it is for the purpose. Let any one who doubts this try to sew leather or canvas with an ordinary packer's needle, which is efficient for the workman's purpose, merely because the sacking he works with is of so open a texture as to be almost a net, and yet the tool is better shaped than the proboscis of Stomoxys, as would soon be seen if one tried to sew sacking with a needle so shapen. Those who have been driven by emergency to use an ordinary sewing needle for suturing the human skin will fully appreciate the force of these arguments, though a sewing needle has a far more delicate point than the proboscis of this fly, and the needle, for strict comparison, should have its point broken off. The labrum, on the other hand, which has a point fashioned exactly like that of the ordinary and very business-like hypodermic needle, is as admirably adapted for piercing as the labium is the reverse, as may be seen from the accompanying camera lucida outline of the two organs drawn from a fly in which the labrum happened to lie separate from the sheath.

FIG. 15.—Outline of head of Stomoxys seen from side and rather from above.

Let us now examine more closely the structure of this organ. The proboscis in the ordinary resting position of the parts as seen in the living insect shows nothing but the labium, or lower lip, the function of which, as already noted in a preliminary communication to this Journal, is, I maintain, simply that of a sheath to the true piercing apparatus. The main part of this consists of a radish-shaped mass, already sufficiently described, and this supports a pair of small lobular organs, the labella, which, apart from the relative proportions of the parts, resemble the larger expansions which are so familiar to us in the favourite popular microscopic object usually labelled as the "tongue of the blow-fly." These lobes are obliquely articulated with the slightly constricted trunk of the proboscis, and in the fresh state can be made to separate by pressing the proboscis down on an object slip or other resisting surface. When in this position, it is needless to say that the labella make the labium even more obviously impossible as a piercing organ than when folded together in their ordinary posture of rest.

If we now proceed to dissect the separated proboscis it will be found that it is not difficult to separate the black outer coating, except from the labella, and that when this is done, we are left with a delicate plate of chitin (sclerite) which forms a sort of median antero-posterior septum, and on either side a great mass of muscle which takes origin from the chitinous furca, which just reach up to the beginning of the thickest part or bulb of the proboscis, and is inserted into the anterior part of the median scleriti by tendinous fibres of varying length. Hence if the proboscis be detached by cutting it off immediately behind the bulb the muscular mass separates from the containing integuments with the greatest facility owing to its being left quite without hinder attachments. Behind, however, there is nothing to prevent the median sclerite from sliding back between the furca.

If we now examine a specimen from which the soft parts have been removed with caustic soda, it will be found that the outer skin, in spite of its blackness and deceptively solid appearance, is thin and flexible, and is, moreover, wrinkled transversely at fairly regular intervals. These transverse folds run almost transversely round the basal part of the proboscis, but towards its extremity, run rather forward on the ventral side to meet together in broad V's. These transverse lines give to the entire organ a close resemblance to a leech, which is much heightened by the remarkable similarity of general contour, and it is impossible to interpret them in any other way than that they are the outcome of habitual infolding which, exactly as in the leech, permits of the whole structure being shortened.

If we now examine a transverse section of the organ it will be found that it consists of a solid conical mass, the anterior side of which is grooved with a narrow rabbet, the depth of which, however, is not more than

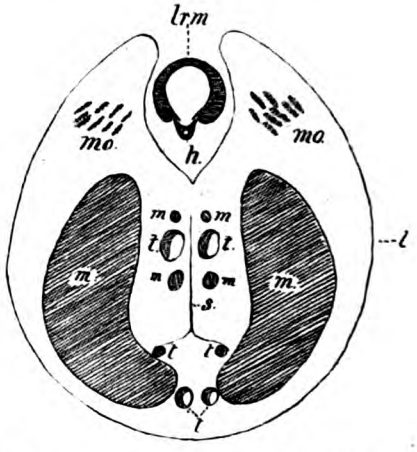

FIG. 16.—Transverse section of proboscis of Stomoxys at about mid-length. *h*, Hypopharynx; *l*, labium; *lrm*, labrum; *m*, muscle; *s*, median sclerite; *t*, tracheæ. Camera lucida, semi-diagrammatic.

one-third of the thickness of the cone. Dividing it into two lateral halves is the median sclerite which is stouter on its ventral than on its dorsal edge, and lies immediately under the skin of the groove dorsally, while the stout ventral margin has attached to it two delicate septa which run off on either side to the great muscular masses and serve to separate the ventral median from the two great lateral air sacs. The entire width of this sclerite is little more than one-third that of the diameter of the cone, and as its thin dorsal edge is close under the rabbet, while the

ventral edge is almost a third of the diameter of the organ from the ventral integuments and separated from them by the great ventral median air chamber. Lying on either side of the axis of the cone are two great tracheæ which break up in front into branches which appear to open into the two antero-lateral air sacs. Behind and in front of each trachea are extremely slender muscles, the hinder rather the thicker, the function of which I am unable to make out, but conjecture that they are in some way concerned in keeping the crease between the labellæ from outfolding under the air pressure of the pneumatic sacs. In the dorsal portion of the section within the alæ forming the sides of the rabbet are seen a number of obliquely divided muscular films. There are two sets of these which serve respectively to separate and to bring together the labellæ; so with the difference that the prehensile lobes of the labella are lateral and symmetrical instead of different and antero-posterior, the whole proboscis presents some resemblance to that of an elephant, though the labella are, of course, relatively far larger. What purpose a pair of soft, hinged flaps can serve, when considered as the point of an awl, is difficult to understand, and it is for those who assert that the function of this elaborate mechanism is simply to pierce the skin, as a bradawl is driven into a plank, to show what may be the object of all this complication, and what may be the function of the various muscles and other parts concerned.

A minute description of even the external anatomy of the labella would alone occupy a lengthy paper, for

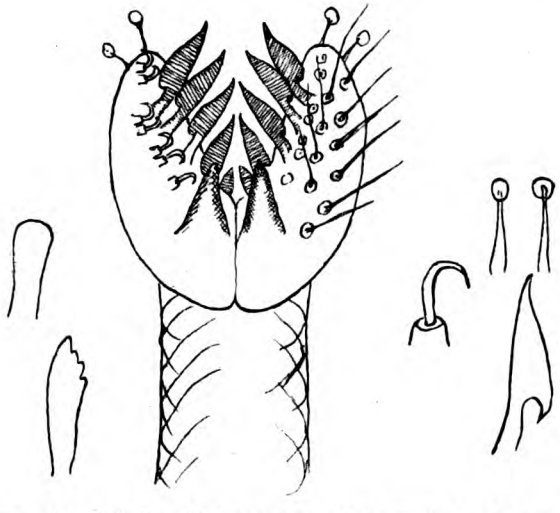

FIG. 17.—Labella of Stomoxys seen from ventral side to show the rank of large teeth. To avoid confusion, the complicated ranks of plates behind them are not represented, and only a couple on each side of the pellate hairs of which about a score are scattered over the end and sides of each labellum. On the left side is shown the rank of grapnel hooks, and on the right the position of these is only indicated by small circles so as to show better the double rank of long bristles.

it is provided with so great a variety of hairs, plates and sense organs that it is extremely difficult to condense an adequate account of it into moderate limits. Internally it is simple enough, the entire space, with the exception of some muscular fibres which are inserted into the bases of some of the larger plates or teeth, being occupied by a large air sac continuous with those of the main trunk of the proboscis, so that the point of this reputed borer is formed by an air cushion.

Viewed ventrally, with the labella slightly separated, it will be seen that the most prominent structures are a row of strong leaf-shaped blades or teeth which project inwards and forwards towards each other, so that in the natural position of rest they are folded together and cannot engage the skin of the blood-yielding animal except when the labella are spread out to full expansion. They are four or five in number on either side (I am not sure of the hindmost, which may belong to another rank of plates), and are the only at all powerful teeth that are to be found, though it is difficult to see how they can effect a sufficiently large wound to admit of the rest of the structure following them. On the other hand, it is easy to see that they can form efficient holdfasts if the labella are pinched together after they have entered the skin when they have been applied to it with labella expanded.

Outside these is a row of very obvious grapnel hooks. These are arranged in pairs, with the exception of the hindmost, which is single, each pair being opposite an interspace between the leaf-shaped blades. Finally, outermost of all, is a double row of rather long, stiff bristles. Quite behind, on either side of the fold between the labella, is a large papilla. The whole of the tips and outsides of the distal third of the labella is sprinkled with very peculiar pellate hairs of extremely delicate structure. There are a score or more of these on each, but a couple only have been drawn to show their relative size, as to do more would needlessly confuse the figure. Their function is probably sensory, and it is conceivable that they may be gustatory organs, as the membrane of the little shield at the end is excessively delicate. From their form and delicacy it is obvious that they would never outlast the labella being once forced into the skin.

To obtain an idea of the complex system of plates and structures behind these it is necessary to make a dissection so as to clear away one

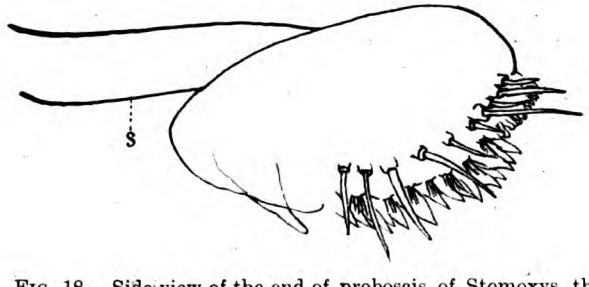

FIG. 18.—Side view of the end of proboscis of Stomoxys, the integument and muscles being removed to show the median sclerite.

labellum, and in doing so, by clearing away the integuments of the supporting trunk, it is easy to establish that the true support of the labella is the median sclerite (*S*) already described. When this

has been done it will be seen that inside the large leaf-shaped blades are two or more ranks of extremely delicate lancet-shaped structures. Next to these a row of tufts of short dense bristles, and inmost a rank of stout bristles. On the most anterior part is a dense mass of minute hooks. Personally, I regard these curious structures as having the function of sufficiently abrading the surface to admit of the character being tested by taste, but there is nothing whatever in their size and form, or in the fact of their presence, to suggest that they are in any way concerned in any deep piercing of the skin of the animal that yields blood to the fly, for "teeth" of this sort are to be found on the labella of all Muscidæ, such as the common house-fly, and which certainly are quite incapable of doing anything more serious than of licking the surfaces of what they feed upon.

I cannot give the exact reference, but if any one cares to look up the files of *Science Gossip* of the early eighties, he will find a series of very interesting papers on these teeth of flies, which are illustrated by some very beautiful coloured plates, and will find that many of the most harmless flies have much more formidable teeth than those with which *Stomoxys* is provided.

(*To be continued.*)

RHINO-PHARYNGITIS MUTILANS.

By C. W. Branch, M.B., C.M.Edin.
Medical Officer, Colonial Hospital, St. Vincent, B.W.I.

Under this title, in the Journal of Tropical Medicine for February 15th, 1906, Dr. Leys describes a condition which he suggests is a distinct disease. As one with some experience of practice in the Tropics and of this particular condition, I wish to raise a protest against this manufacture of new diseases out of the manifestations of syphilis.

A mere pathological entity should not be put forward as a disease *sui generis*. By this process we have had several diseases created out of tuberculosis. Syphilis of the nerve system has provided locomotor ataxia, general paralysis, &c. But perhaps the most fertile field for the discovery of new tropical diseases is syphilis of the skin.

Considering the incalculable importance to the human race of the recognition of syphilis, and the difficulty as yet of confirming diagnosis by any certain test, it is most inadvisable to claim independence for any condition, which may reasonably be attributed to syphilis, until its etiological individuality can be established.

Far better is it to treat everything as syphilis than to miss the diagnosis of half the cases of syphilis. In the Tropics, at least, this is true, where perhaps two-thirds of the sickness is syphilis.

This destructive rhino-pharyngitis is extremely common in some parts of the West Indies. Those of us who do not attribute it to syphilis call it, with Dr. Rat, a tertiary of yaws.

Of all works on yaws, that of Dr. Rat is perhaps the best. He is a careful and conscientious observer, but, as can be seen by his laborious compilation of previous writings, he is limited by his reverence for tradition and authority. This, however, could not detract from the accuracy of his descriptions, and I believe any one who reads his report with an open mind must see that, after all, yaws is only syphilis, as Jonathan Hutchinson says in his preface to Rat's report.

We are yet at the threshold of the arcana of syphilis, though the disease would seem to be as old as Pithecanthropus, and is clearly referred to in the Chaldean epic of Izdubar.

To understand this protean disease we must realise that various factors intervene to determine its manifestations. We can appreciate some of these. The races or individuals who tax their nerve systems suffer from nerve syphilis, which is comparatively rare among negroes.

The negro, with his highly specialised and active skin, displays an exuberance of eruptions rarely seen in Europe. The labourer exposed to injuries develops grave bone lesions. The women in St. Kitts, who habitually gratify the desire of sailors for pedicatio mulierum, get stricture of the rectum.

Some of the determining factors we have yet no knowledge of, others we can now guess at.

In yaws Castellani found a spirochæte morphologically identical with *Spirochæta pallida* and one or more of the *refringens* type. If we assume for the present that *S. pallida* has an etiological significance in syphilis, then the other spirochætes, or perhaps bacteria, may be the determining factors explaining the form of the yaws eruption.

I find in dirty sores, which have no apparent relationship to syphilis or yaws, spirochætes of one or more types which are identical with those I find associated with *pallida* in yaws. I think I can recognise sores in which these spirochætes will be found.

Some cases of another kind of sore have been observed associated with great œdema, but not inflammation of the legs. These are considered by myself and another man who has seen them with me to be due to tertiary syphilis. But they showed a marked identity and distinctness of features, and one finds another spirochæte in such swarms that the secretion consists almost entirely of the organisms, with very few pus cells.

Until the relationships of *S. pallida* and *Cytorrhyctes luis* to each other and to syphilis are worked out, or until some other certain test of syphilis is established, we have no right to foist a new disease on an already overburdened list. It must be possible, first, to exclude syphilis by the absence of some essential element.

Dr. Leys tritely calls attention to the disproportion in numbers of his cases and those of Dr. Rat in Dominica to the populations, and compares the frequency of syphilis of the palate and pharynx in a large European community. I noticed in a hospital report for 1902 (Colonial Reprints, Medical Reports, 1904), that destructive rhino-pharyngitis was exceedingly common on the leeward side of St. Vincent, while on the windward side destruction of the face took its place. Syphilis is equally prevalent on both sides of the island, but the land conditions are very different. The leeward side consists of deep ravines with numerous streams; there is dense tropical growth and combined heat and moisture.

These same conditions obtain in Dominica, in parts of St. Lucia, in Grenada, but not in Nevis nor Anguilla, and hardly at all in St. Kitts. Since he left Dominica Dr. Rat has been stationed in St. Kitts and Anguilla, and is now in Nevis. He has not observed the destructive rhino-pharyngitis in these places.

I have no doubt that Guam provides the conditions I have attributed to the leeward of St. Vincent, and shall be interested to hear from Dr. Leys, whose address is, necessarily, a changing one.

Syphillis and yaws are excessively prevalent in all West Indian colonies. Syphilis more so where yaws is not much accredited, as in St. Kitts and St. Vincent yaws, that is, the frambœsial eruption, is certainly, I admit, more prevalent under the same conditions referred to as favourable to rhino-pharyngitis.

Since reading Dr. Leys' paper I took the first opportunity of examining smears from a case of "leeward sore throat," as I have been in the habit of calling this condition. There was present in small numbers a spirochæte, other than *pallida*, in a scraping from the active edge of the ulcer. Pus from the surface did not show any spirochætes.

I shall pursue this enquiry as opportunities present. My suggestion is that it may be varieties of spirochætes which determine the form of the manifestation of syphilis in the case of yaws which is a secondary, and in rhino-pharyngitis mutilans and my "œdematous sore foot," which are tertiaries.

"Annales de l'Institut Pasteur," Paris, vol. xx., No. 1.

YELLOW FEVER AND MOSQUITOES.

Marcheoux and Simond, in their second report of the French Yellow Fever Commission in Brazil, state that the *Stegomyia fasciata* is the only mosquito known which does not die after depositing its first batch of eggs. The female may lay several batches of eggs. Infection of the mosquito by heredity, although possible, is not general. *Stegomyia* do not feed on the black vomit, stools, or blood from the hæmorrhages occurring in yellow fever patients, unless compelled to by want of other food. The larvæ of *Stegomyia* developing in water in which dead infected mosquitoes have been thrown do not acquire the power of infecting man. In only one case was hereditary transmission experimentally proved, and the resulting infection of man was very mild. The *Stegomyia fasciata* mosquito, kept at a temperature of 68° F., loses power of infecting. The virus of yellow fever has been artifically transmitted from one mosquito to another in the laboratory, but successive passages proved negative. During the incubation stage of yellow fever, mosquitos cannot become infected.

"Bulletin et Memoire de la Société Méllicate der Hôpitaux de Paris," February 1, 1906.

QUININE FORMATE.

Lemoine, G. H., advocates in the early stage of malarial attacks an hypodermic injection of quinine formate, 3 grs. in 1 oz. of water.

"L'Echo Médical du Nord," February 26, 1905.

TREATMENT OF ORIENTAL SORE.

Malméjac, F. As the result of experience at Biskra, the author finds the best local treatment is boiled distilled water at a temperature of 60° C. (140° F.). When crusts are present a stream of water is allowed to flow on these, especially into the edges and cracks. A dry antiseptic dressing is then applied. The treatment is repeated twice a day for a week, the crusts usually separate in two or three days; at the end of a week only one dressing a day is required.

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THE

Journal of Tropical Medicine

MAY 15, 1906.

A LESSON IN PRESERVATION OF HEALTH IN THE TROPICS.

REPORT OF THE PRESIDENT OF THE SAPELE SANITARY BOARD, DECEMBER 31, 1905.

SIR RALPH MOORE, when authorising the arrangements laid before him for sanitary work here, gave it as his opinion that three years should show whether the scheme to be applied was of value or not. These three years have now been completed, and I am glad to say that the experiments of making a Local Sanitary Board has proved a success, and further, to tell you that as a consequence a Local Board is about to be made at the town of Ko Ko further down this river, where Europeans are now also residing.

The supreme obstacle to systematic and continuous work in tropical West Africa is the rapid changing that sometimes takes place in the *personnel* which has to carry out the work, and it is for this reason that a Board composed of traders and officials was constituted, because it was seen that a Board would not "go away," and further, that it would have a continuous knowledge of the policy to be pursued. You will appreciate how great the change amongst individuals sometimes is, when I tell you that during the three years the Board has existed there have been five, I might almost say six, different administrators holding the office of High Commissioner, four different officers have acted as Divisional Commissioner, four others have acted as District Commissioner of Sapele, four others as Assistant District Commissioner, and, moreover, there have been three District Medical Officers here; finally,

with the exception of the doctor who started the whole scheme and has recently returned here, there is not a single member of the present Board who was also a member of the Board when it started.

The triumph of the Board is that not only has it lived through all these changes and done good work, but also that the local changes, with possibly one exception, were not due to ill-health.

The Board acts in four ways: Firstly, it acts by actually carrying out sanitary work, removing vegetation, surface water, &c.; secondly, it acts as an object-lesson, inspiring bush clearing, &c., even where a sanitary board does not exist; thirdly, it acts by interesting Europeans in sanitation, and as a corollary in quinine-taking as a preventive of malaria; fourthly, in proving the value of a sanitary board, it supports the arrangements for creating one at Ko Ko.

During the time the Board has been at work it has succeeded in dealing with almost the whole area of the reservation; and although parts of this area are not finally finished, yet a considerable portion around the European dwellings has been completed, and the work done will in future require only to be kept up.

The Board has tried many ways of employing labour; local boys, boys from the Benin country and the Ejor country have been tried, also prison labour, and the conclusion that has been come to is that no matter what labour is employed, it is best to give out the work as piecework, either to individuals or native contractors.

I have here certain figures gathered from the records of the Sapele District Medical Officers, and from them it will be seen that the healthiest time of the year here at Sapele used to be, and still is, the rainy season. This is the period of lowest maximum temperature. The figures, expressed graphically, show that the curve of the sick list falls as the maximum temperature falls and the rain curve rises. The sick list curve is now altogether so near zero that it is difficult to appreciate its undulations, but June, which is always one of the heavy rain months, this year had no European inhabitant sick during its entire length.

We are fortunate in having no death among the *bona fide* European inhabitants of Sapele for more than three years, this, though a thing to be thankful for, must not be considered too much, for that death will occur both at home and abroad we all know only too well. In the Blue Book for 1904, relatively a large number of deaths are shown under the name of Sapele, but these deaths occurred in people living in outlying parts of the district, and not to inhabitants of the reservation.

What these vital statistics mean, put commercially, is this, that for a cost of 9s. per month for each European of Sapele Reservation for the year 1905, his chances of being sick have been reduced from five and four-fifths times each year to one and two-fifths each year.

A new firm has commenced business on part of the land cleared and reclaimed by the Board, and I have reason to believe that the rent paid by it will be given to the Board to be expended in still further work. There is a lot still to be done; keeping down the vegetation is itself a labour like rolling a big stone up an endless hill.

During the incoming year, however, the question of disposal of refuse or water supply might, with advantage, be considered. In any event, I am confidently hoping the future members of the Board will be keen to maintain the record, namely, that in spite of an increasing European population the amount of sickness decreases, and that they will cause the Board to remain in the sound financial condition it has always enjoyed.

FRANZ STAHL, *President.*

Table showing Number of European Residents under Medical Treatment.

(1st, before the Board. 2nd, after the Board.)

		January	February	March	April	May	June	July	August	September	October	November	December
1st	1900	8	8	6	6	5	3	4	8	9	5	8	9
	1901	12	9	10	4	5	6	4	10	10	12	9	10
	1902	11	12	12	8	5	4	4	4	7	5	9	6
2nd	1903	7	9	8	10	8	12	6	5	6	4	5	3
	1904	5	3	3	2	3	3	2	2	3	5	3	4
	1905	3	4	1	4	4	0	3	1	3	1	4	3

Table showing Average European Population for the Year 1900-1905, including actual Number of Deaths.

		Population	Deaths
1st	1900	14	2
	1901	15	1
	1902	17	2
2nd	1903	19	0
	1904	23	0
	1905	25	0

Balance Sheet of the Sapele Local Sanitary Board, December 31, 1905.

Dr.	£	s.	d.		£	s.	d.
To balance on hand	26	12	3	By Bush	14	18	0
,, Special Government grant ..	75	0	0	,, Swamp clearing and bush ..	45	15	0
,, Rates on compound paid	67	10	0	,, River front and drain clearing	35	0	0
,, ,, due ..	22	10	0	,, Sobo gang ..	1	10	0
,, Grant—part of fine paid by Messrs. Pinnock, Ltd., for taking up cleared ground	25	0	0	,, Eddy—monthly	34	15	0
				,, Balance in hand	84	14	3
	£216	12	3		£216	12	3

Correspondence.

"HORSE-FLIES (TABANIDÆ) AND DISEASE."

To the Editor of the JOURNAL OF TROPICAL MEDICINE.

SIR,—In my article under the above heading in your issue for April 2nd last, I unfortunately omitted to mention that in Algeria it has been shown by Drs. Edmond and Étienne Sergent, by means of experiments upon laboratory animals, that *Tabanus (Atylotus) nemoralis*, Mg., and *T. (Atylotus) tomentosus*, Macq., are capable of transmitting the trypanosome of the disease of dromedaries, called *Debab*, which occurs from Morocco to Syria, and more than decimates the Algerian camels. In most of the experiments transmission was direct, but in one case, in which six or eight specimens of *Tabanus tomentosus* were used, an interval of twenty-two hours had elapsed since the flies had

bitten an infected rat. Actual experiments upon camels do not appear to have been made, but the natives of North Africa always assert that the disease is transmitted by *Tabanidæ*, and camel-drivers declare that the two species mentioned above, which apparently are far more common in Algeria than any others, are especially dangerous to camels. The disease, which is almost invariably fatal, commits great havoc among animals that have passed the summer in a locality where horse-flies are numerous, but among others that have spent the time in a place where *Tabanidæ* are almost absent its incidence is slight *C.f.*, "El-Dehab Trypanosomiase des dromadaires de l'Afrique du Nord," by Drs. Edmond and Étienne Sergent (*Annales de l'Institut Pasteur*, T. xix., January, 1905, pp. 17-48). My thanks are due to Dr. Edmond Sergent for his kindness in drawing my attention to the very interesting and important paper in question.

I am, &c.,

ERNEST E. AUSTEN.

British Museum (Natural History),
Cromwell Road, London, S.W.,
April 28th, 1906.

Abstract.

CARRION'S DISEASE: VERRUGA PERUANA AND ITS BACTERIOLOGY. By Dr. M. O. Tamayo (*La Cronica Médica*, November 30 and December 15, 1905.) Translated by M. D. Eder.

Dr. Barton, in 1899, isolated a bacillus from the spleen in several cases of pernicious fever in Carrion's disease. He described the bacillus, pointed out its differences from the *B. coli*, and concluded that it was the specific causal agent of verruga peruana.

We have examined all cases of this disease that we have been able to find in the hospitals of Lima during the last few years; they number thirty in all.

Our studies confirm Dr. Barton's researches, in so far as that the organism he described is indeed frequently present in such cases. Clinically, the thirty cases may be divided into two groups:—

(1) Those where fever was the main clinical symptom. This comprises most cases.

In twenty of these cases bacteria were found in the blood during pyrexia, which, by their morphological and cultural characteristics, belong to the paratyphoid group.

In periods of apyrexia in most cases the blood did not contain the organisms (see Case 10).

(2) Those without fever.

In these cases no bacilli were found. Our cultures, whether made from patient's blood, from the juice of the warts, or fragments of these growths, remained sterile.

The bacteriological work consisted in:—

(*a*) Microscopic examination of the blood and fluids of patients.

(*b*) Cultures from the blood on different media (we used a sterile Pravaz syringe for withdrawing blood from the veins, the skin being previously carefully disinfected).

(*c*) Inoculation on various animals—guinea-pigs, rabbits, Chinese dogs (*Canis caribeus*), three horses, and one monkey.

(*d*) In fatal cases we made cultures from the blood of the heart, spleen, liver, pulmonary veins, and from portions of bone marrow.

Pure cultures are easily obtained from the blood of febrile patients. The bacillus grows rapidly on peptonised broth, agar, gelatine, &c., at 37°. The blood does not arrest the growth of the organisms (Eberth's bacillus). No bacillus was found in the blood under the following circumstances:—

(i.) In the apyrexial variety, where other symptoms were prominent, *e.g.*, copious eruptions, progressive anæmia, arthralgias. There was no question here of the fever being latent.

(ii.) In slightly febrile cases.

(iii.) Transitory rises of temperature in cases that were running a typically afebrile course.

Inoculation experiments with pure cultures gave the following results:—

(1) A few drops[1] inoculated into the subcutaneous tissue of rabbits weighing 1,500 to 2,000 grammes frequently killed them, the animals dying with all the symptoms of acute septicæmia.

(2) Intraperitoneal inoculations usually caused death with *post-mortem* signs of acute peritonitis.

(3) In some cases intravenous injections did not cause the death of the rabbits. After a few days of fever and signs of septicæmia the animal recovered; there was at no time any eruption. When the animals were killed some months afterwards, no eruption, external or internal, was found, nor did we find any pathological condition, either recent or old.

Guinea-pigs are also very susceptible to inoculations. Intravenous inoculations produce a rapidly fatal septicæmia.

Dogs are more resistant. Intravenous injection of small quantities of a virulent culture give rise to fever which disappears in a few days. Repeated inoculations can be made until the animal becomes immune. The serum is then agglutinative for the same bacillus. Careful observation during many weeks showed the animals to be perfectly healthy.

Horses.—Injections of high potency and virulence were made into the jugular veins of three horses. Two recovered completely in a few days after having had some signs of a slight septicæmia. No granulomata or other effects appeared. The third animal died of acute septicæmia; it had received a large dose of a hypervirulent culture.

Small Monkey (*Ateles ater*).—Repeated inoculations with the blood withdrawn from the verrugæ, and with cultures of Barton's bacillus, gave no results. After a few days of slight septicæmic trouble he recovered perfectly, and is still in the Institute in complete health. His serum readily agglutinates the bacteria taken from the verrugæ.

To this experimental work we must add a few remarks on the clinical aspect of the febrile cases which is so very similar to that of typhoid fever. Note the general apathy, the dry tongue with its light band of fur, the tenderness over the epigastric and the hypochondriac regions. Diarrhœa is a fairly constant feature, and resembles in every particular that in enteric. The temperature chart is characteristic of enteric; there is at first a gradual daily rise; then a

[1] The vagueness is in the original.

ANALYSIS OF TWENTY-SIX CASES OF VERRUGA PERUANA.

(In four others the clinical notes are not obtainable.)

No.	Fever present	Eruption present	No. of red blood corpuscles (a).	Result of bacteriological examination	Result	History	*Post mortem*
1	Continued ..	Scanty ..	985	+	Recovery ..	Severe diarrhœa; headache; liver and spleen enlarged; insomnia.	
2	,, ..	None ..	..	+	Died ..	Severe diarrhœa; prostration: articular pains; spleen and liver enlarged; severe anæmia.	
3	,, ..	None during life—a few found in spleen *post mortem*	1,800	+	,, ..	Severe diarrhœa; prostration; cephalalgia; insomnia	Few warts on border of spleen.
4	,, ..	Discrete miliary	..	+	Recovered ..	Severe diarrhœa; vomiting; tender abdomen; albumin; anæmia.	
5	,, ..	None	2,400	+	Died ..	Severe diarrhœa; vomiting; insomnia; arthralgia	Nothing special.
6	,, ..	Miliary and nodular	1,900	+	Died of tuberculosis ..	Arthralgia; prostration; spleen and liver enlarged.	
7	Hyperpyrexia, 42° C.	None ..	..	Made *post mortem* from blood of heart +	Died ..	Laveran's organism found during life; diarrhœa; vomiting; complicated by malaria	Nothing special.
8	Continued ..	,, ..	..	*Post mortem* +	,, ..	Intense anæmia; epistaxis; diarrhœa; cephalalgia; articular pains spleen and liver +	,, ,,
9	Remittent ..	Four days before death	1,700	+	,, ..	Cephalalgia; arthralgic pains in bones.	
10	,, ..	Appeared after Apyrexia	1,400	+	,, ..	Cephalalgia; arthralgia; diarrhœa; liver and spleen enlarged. The eruption disappeared; the patient relapsed, dying in a few days.	
11	Present ..	None ..	3,500	+ (from heart)	,, ..	Constipation; then diarrhœa	Negative.
12	Slight ..	Extensive nodular	..	Negative ..	Recovered ..	Subicteric tinge; liver enlarged; spleen not palpable; digestion normal; cephalalgia; arthralgia.	
13	Continued ..	None ..	..	Positive ..	,, ..	Tender abdomen; diarrhœa; vomiting.	
14	None	Abundant	..	Negative ..	,, ..	Negative.	
15	Slight	,, ..	..	,, ..	,, ..	Anæmia; digestive apparatus normal.	
16	Continued ..	None ..	2,000	Positive ..	,, ..	Diarrhœa; liver enlarged; insomnia; prostration.	
17	,, ..	Extensive	..	,, ..	,, ..	The granulomata suppurated, and there was found in the pus the *B. paratyphoid* and a fluorescent bacillus.	
18	None	Four months' duration	..	Negative ..	,, ..	Nearly the whole body was covered with the eruption; slight epistaxis.	
19	Very slight ..	Nodular ..	..	,, ..	,,		
20	Intermittent ..	,, ..	..	,, ..	,, ..	Repeated blood examinations. Laveran's organism was not found.	
21	None	,, ..	1,048	,, ..	,,		
22	,, ...	Present ..	1,200	,, ..	,, ..	Severe epistaxis; diarrhœa; prostration; enlarged liver and spleen.	
23	,, ...	Miliary ..	..	,, ..	,,		
24	Slight	,, ..	..	,, ..	,, ..	Cephalalgia; pain in bones; three weeks after arriving at the endemic centre.	
25	None	Nodular ..	..	,, ..	,, ..	Negative.	
26	,, ...	,, ..	..	,, ..	,, ..	Pains in joints.	

(a) Thousands per cubic millimetre.

period of continued fever; finally, as convalescence ensues, the fever, synchronous with the attenuation of all the other symptoms, becomes remittent. The average duration of the fever is twenty-five to thirty days (Odriozola, " La Maladie de Carrion ").

It must be noted that there is no connection between the fever and the order of the appearance of the granulomata. Sometimes the fever ends just when the verruga appears; sometimes the reverse holds good—the verruga disappears and fever commences.

To sum up our results :—

(1) Barton's paratyphoid bacillus is found only in cases of pernicious fever of Carrion's disease.

(2) Inoculations do not give rise to verrugæ, but to a typhoid septicæmic state.

(3) Carrion's pernicious fever is a typhoid or paratyphoid disease, attacking the patients suffering from verruga.

(4) Barton's bacillus is not the pathogenic agent of verruga peruana.

(5) Barton's bacillus gives rise to a secondary infection occurring during an attack of verruga, which attack predisposes to the infection. This secondary affection has all the clinical characteristics of enteric fever.

Review.

THE MANAGEMENT OF A PLAGUE EPIDEMIC. By E. F. Gordon Tucker. Calcutta: Thacker, Spink and Co., Government Place. 28 pp. Illustrated. Price 1·8 rupees.

The substance of this concise book appeared in *Indian Public Health*. The object of the writer is to present in a readily followed statement the steps to be taken by a medical officer placed in charge of a town or district stricken with an epidemic of plague. The subject is dealt with under the following headings: (1) The Termination of the Period of Quiescence; (2) The Arrival of the Primary Infecting Agent; (3) The Stage of Sporadic Atypical Cases; (4) The Stage of Local Place Infection; (5) The Early Epidemic Stage; (6) The Fastigial Stage of the Epidemic; (7) The Stage of Decline; (8) The Stage of Residual Infection; (9) The Commencement of the Period of Quiescence and a Temporary State of Local Immunity. An excellent book, that will prove a great help to any medical man placed in charge of an outbreak of plague in any part of the world.

Drugs and Remedies.

TREATMENT OF BLACKWATER FEVER.—The Bipalatinoid, prepared by Oppenheimer, Son and Co., 179, Queen Victoria Street, London, E.C., for use in the treatment of blackwater fever, continues to give satisfactory results.

Full particulars have been reported upon no fewer than twenty-one consecutive cases of recovery, without a single death, and without sequelæ or complications of any form of urinary suppression. This experience is encouraging and unique, and we hope to hear of further cases in which this bipalatinoid has been used. It will be remembered that it was the Principal Medical Officer of British Central Africa who suggested the treatment to Messrs. Oppenheimer in the first instance.

"TABLOID": SODIUM CITRATE.—Messrs. Burroughs Wellcome and Co. have prepared a sodium citrate "Tabloid," grs. 2 (0·13 gm.), for use in cases in which either the mother's milk or cow's milk does not suit the infant.

The digestibility of cow's milk is greatly assisted by the addition of sodium citrate. The explanation of the action which is commonly given, is that the acid caseinogen and the calcium salts of milk in presence of the gastric juice form a thick casein clot. If sodium citrate be added to the milk, it combines with the caseinogen to form a sodium compound less dense and more absorbable than the calcium caseinogen compound in the normal milk clot. The calcium salts in the milk unite with the citric acid of the sodium citrate and the resultant calcium citrate is diluted by the stomach contents and absorbed. Thus the introduction of sodium citrate increases the digestibility of cow's milk in a remarkable manner, allows the absorption of the calcium salts, and greatly enhances the food value of the milk.

Notes and News.

W. J. R. SIMPSON, M.D., F.R.C.P., D.P.H., Professor of Hygiene, King's College, London, and Lecturer in Tropical Hygiene at the London School of Tropical Medicine, has sailed for Singapore to serve on a Commission to enquire into and report upon the sanitary condition of Singapore. The appointment was made by the Colonial Office acting on behalf of the Government of the Straits Settlements. Professor Simpson's excellent work, whilst engaged on similar commissions in South Africa and Hong Kong, is fresh in our memories, and we anticipate equally brilliant results from the present Commission.

Surgeon-General James Pattison Walker, who died recently, at the age of 86, joined the Medical Service of the East India Company in 1845. He served with distinction during the Mutiny, and amongst other important positions he occupied the Chair of Hygiene in the Calcutta School of Medicine.

Whilst H.M.S. *Black Prince* was on view to the public, the ship was visited by 21,000 persons. No less than £1,100 was received for the benefit of the Seamen's Hospital Society and the Poplar and West Ham Hospitals.

Surgeon-General Spencer, I.M.S. (retired) has been appointed Honorary Surgeon to the King.

To remove rust from instruments, according to the *Pharmaceutische Zentralblatt*, rusty surgical instruments are (1) placed for twelve hours in saturated solution of stannous chloride; (2) rinsed in water; (3) laid in a hot solution of soda soap; (4) dried; (5) or rubbed with absolute alcohol and (6) prepared chalk. Another method is to lay the instruments in kerosene. As a preservation against rust, paraffin oil may be applied as follows: The instruments, after being dried and warmed, are laid in a solution of 1 part paraffin and 200 parts benzine. Subsequently the benzine is allowed to evaporate before the instruments are laid aside.

The British Association meet at York on August 1st, 1906.

Association of Medical Officers of Missionary Societies.

The above Association was formed in March, 1904, on the initiative of Mr. W. McAdam Eccles, Dr. C. F. Harford, and Dr. J. N. Kelynack, and now includes, as members, medical representatives of practically all the foreign Missionary Societies.

The object of the Association is the discussion of subjects relating to the selection of missionaries as regards their physique and to all matters concerning the preservation of their health abroad.

Meetings take place quarterly at the various members' houses, and amongst others the following have opened discussions: Sir Patrick Manson, Dr. S. H. Habershon, Colonel T. H. Hendley, I.M.S., Dr. C. F. Harford, Mrs. Scharlieb, M.D., and Wm. McAdam Eccles, M.S., F.R.C.S.

Panama.

Deaths from Yellow Fever and Malaria, in the city of Panama, since 1884. Taken from Report of Department of Health of the Isthmian Canal Commission for July, 1905.

	Deaths from yellow fever.	Deaths from malarial fever.
1884 ...	68	491
1885 ...	174	687
1886 ...	281	497
1887 ...	259	481
1888 ...	82	448
1889 ...	33	249
1890 ...	0	198
1891 ...	17	178
1892 ...	1	133
1893 ...	1	142
1894 ...	0	137
1895 ...	0	138
1896 ...	0	168
1897 ...	45	203
1898 ...	0	161
1899 ...	87	190
1900 ...	109	178
1901 ...	5	134
1902 ...	202	562
1903 ...	51	178
1904 ...	8	162
1905 ...	27	97
Average ...	66	264

Livingstone College.

On Thursday, May 31st, Livingstone College, Leyton, E., celebrates its Commemoration Day. The programme of proceedings is as follows:—

The chair will be taken at 3.30 by J. A. Simon, Esq., M.P. for the Walthamstow Division of Essex, unless prevented by his official duties.

An address will be given by James Cantlie, Esq., F.R.C.S., and by the Rev. J. E. Watts-Ditchfield, Vicar of St. James-the-Less, Bethnal Green.

A short statement as to the progress of the College will be made by the Principal, Dr. Harford.

Personal Notes.

Indian Medical Service.

India Office: Arrivals of Indian Medical Officers in London.—Lieutenant-Colonel P. D. Pank, Lieutenant-Colonel J. Sykes, Lieutenant-Colonel A. C. Younan, Captain W. H. Kenrick, Captain A. T. Pridham.

Extensions of Leave.—Lieutenant-Colonel A. V. Anderson, 6 m., Med. Cert.; Major A. R. P. Russell, 4 m., Med. Cert.; Captain L. Hirsch, 5 m., Med. Cert.; Captain R. D. Willcocks, 4 m., Med. Cert.

Permitted to Return to Duty.—Lieutenant-Colonel H. Armstrong.

Postings.

Dr. H. A. Macleod to Civil Surgeon, Saharanpur.

Major G. Y. C. Hunter officiates as Superintendent, Central Jail, and Civil Surgeon, Montgomery.

Captain C. J. Robertson Milne, Superintendent Central Lunatic Asylum, Lahore, in addition to his other duties.

Captain L. B. Scott, services lent to Government of Assam.

Captain N. S. Wells, services lent to Jail Department, Bengal.

Colonel A. M. Crofts, at disposal of Home Department.

Captain H. Ainsworth to Plague Duty, Lahore.

Major G. B. Irvine, Civil Surgeon, Jhelum.

Captain G. E. Charles officiates, Prof. Anatomy, Lahore.

Leave.

Major R. J. Marks, privilege leave, 2 m. 24 d.

Lieutenant-Colonel W. Coates, Med. Cert. and privilege, 7 m.

Major A. H. Nott, furlough and privilege leave, 17 m.

Major R. H. Maddox, combined leave, 18 m.

Domestic.

Births.

Oxley.— At Seoul, C.P., on April 5th, the wife of Captain J. C. S. Oxley, of a son.

Colonial Service.

J. B. Addison, M.R.C.S., L.R.C.P., is acting as Chief Medical Officer of the Seychelles.

*Dr. E. W. Blyden will terminate his five years' engagement with the Government of Sierra Leone on July 1st, 1906.

*Dr. J. D. Bolton, of Mauritius, has been appointed Government Medical Officer of the Dependency of Rodrigues.

R. Denman, M.R.C.S., L.S.A., D.P.H., Chief Medical Officer, Seychelles, is on leave.

A. Nicolle de Gruchy, M.B., C.M.Edin., Assistant Medical Officer, Seychelles, has been transferred to Southern Nigeria as Medical Officer.

G. F. Leicester, M.B., C.M.Edin., Assistant at the Institute for Medical Research, Selangor, Federated Malay States, is at present acting as District Surgeon in Selangor.

*Dr. A. J. McClosky, District Surgeon, Selangor, Federated Malay States, is on leave.

* Name not entered in the "Medical Directory" for 1906.

[Reference is made to the fact that the name is not entered in the "Practitioners Resident Abroad" list in the hope that all medical men abroad may see to it that their names are duly entered in this list.—Ed., *J.T.M.*].

Colonial Economic Notes.

Antigua.—The area of the cultivation of cotton was considerably increased during 1905. Owing to deficient rainfall both the cotton and sugar crops suffered.

Barbados.—Cotton cultivation is extending. Banana growing has received a check, as no profits are being obtained; regular mails and proper cool storage in all ships can alone restore the banana industry.

British Guiana.—It is proposed to appoint a Royal Commission to enquire into the condition of the Colony generally.

Montserrat has had a record cotton crop.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Nature," December 25, 1905.

THE PULSE OF THE ATMOSPHERIC CIRCULATION.

Shaw, Dr. Few of those whose lot is cast in the regions south of the Equator which are swept by the "Trades" have any idea that there can be any connection between the force of the wind current and the weather at home in England. And yet the above very interesting and suggestive paper advances strong reasons for believing that such is the case. Dr. Shaw himself regards his hypothesis as "too speculative for an official report," but "too suggestive to be altogether ignored," and the gist of the thesis is that strong southern trade winds are associated with wet weather in England and the neighbouring parts of the world.

This conclusion is based on the analysis of several years of anemometer records from the Island of St. Helena—and the curves plotted from these data correspond so closely with those of English rainfall that one can scarcely fail to agree with Dr. Shaw in the conclusion that the "connection can hardly be pure coincidence." The seasonal curves of the two sets of data correspond very closely, the minima of both falling in April, though the principal maximum of English rainfall, which occurs in October, lags a little behind that of the force of the trade wind which is found in September. What is even more remarkable is that the otherwise bold curve is in both cases broken by a second small rise in April. It is also undoubtedly the case that years of weak trade winds at St. Helena are associated with drought in England.

More than this, however, cannot be affirmed, as the proverbial fickleness of English weather makes the comparison disappointing when followed up in detail; so that, undoubtedly, other and disturbing factors are at work, and, as Dr. Shaw points out, "the transformation of energy in rainfall is on a vastly greater scale than that displayed by the trade winds." In any case, the observation seems promising, and emphasises the urgency of greater attention being devoted to colonial meteorology.

"Geographical Journal," February, 1906, p. 182.

CLIMATIC FEATURES OF THE PLEISTOCENE ICE AGE.

Albrecht, Peuck, Prof., bases his treatment of the subject on physio-geographical research, considering that attention has hitherto been too exclusively devoted to theoretical astronomical speculations, and to supposed alterations in the earth's axis of rotation. He shows that the snow-line "arches" across continents being higher inland than on their shores, the present level for Europe being almost 7,000 feet for littoral and 9,000 feet for inland localities. Now, in the Ice Age, what is now central Europe was near the sea, and at that time the snow-line for littoral regions was no more than 3,000 feet or less. The diminution of mean annual temperature required to produce such an effect need not, however, have been at all as great as one might imagine, "we are entitled to assume that a rather slight decrease of, say, 2° to 3° C., if connected with a diminution of the summer temperature will cause an ice age. Such a decrease will cause also changes in the amount and distribution of precipitation and the glaciations themselves will influence climatic conditions by altering the distribution of air pressure and the arrangement of the isothermic lines." The lowering of temperature was world-wide, being found as markedly in New Zealand as in Europe; and in latitudes too low for glaciation to result, a rainy period was substituted. In addition to the two great glaciations that occurred in the Permian and Pleistocene periods respectively, there have been minor variations of mean temperature, which have merely resulted in extension and contraction of existing glaciers in temperate regions; and of corresponding epochs of moisture and of desiccation in the warmer parts of the globe. At present the glaciers are contracting and the desiccation of the interior of the continents is in progress, but probably in course of time the opposite process will be substituted, as it appears that four hundred years ago the limits of the glaciers were very much as they now are, though there has been an intervening period of extension.

Meanwhile, however, the drying up of the continents is seriously diminishing the available habitable area, as, for example, in the Kalahari Desert, where, within the last fifty years the well-known lake Ngami has disappeared, and many river-beds have dried up.

"Roussky Vratch," December 24, 1905.

PLAGUE IN MANCHURIA.

Klognitski found cases of plague in a small settlement on the Chinese Eastern Railway, in Manchuria. The population numbered 152, and 15 persons developed plague, of whom 13 (86·6 per cent.) died.

It was impossible to trace the origin of the outbreak, or to prove that the rats or mice in the neighbourhood were infected.

"Annales d'Hygiéne et de Médecine Colonial," No. 3, 1905.

PHAGEDÆNIC ULCER.

Bouffard. The ulcer extends slowly in tissues slightly bruised, but spread rapidly when there has been severe contusion. The presence of the phagedænic bacillus is the primary cause. Secondary infection of other bacteria, usually streptococci and staphylococci are always found when the ulcer is spreading rapidly. When there is no secondary infection the ulcer tends to diminish. The ulcers last from a fortnight, at least, to three months or more. The pus from the centre of the ulcer is not inoculable when inserted under the skin or into the peritoneum of dogs, cats, gazelles, or monkeys, nor could incised or contused wounds in these animals be infected. These investigations were carried out in Somaliland. After treating over 800 cases, the author finds the best results are attained with the following treatment. Ulcers of an inch diameter are swabbed with tincture of iodine, or of perchloride of iron. They are then swabbed with 1 in 200 very hot aqueous solution of cocaine. Larger ulcers are treated with 1 in 1,000 permanganate of potash, by means of a bath for the limbs, and irrigation for ulcers on the trunk, and at night the permanganate is used in fomentation. The disappearance of the phagedænic bacillus from the ulcers is coincident with the flattening of the edges, the lessening of the discharge, the pus, from yellow in colour and of an offensive odour, becomes white and odourless, and the base is red without any necrotic tissue. When this occurs 1 per cent. solution of picric acid is used for irrigating and dressing.

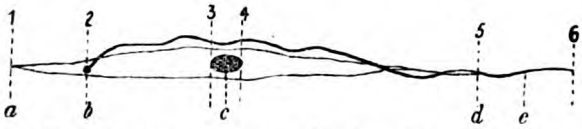
"Quarterly Journal of Tropical Veterinary Science," January, 1906.

(I.) A NEW SPECIES OF TRYPANOSOMA FOUND IN THE BLOOD OF RATS, TOGETHER WITH A NEW METRICAL METHOD OF STANDARDISING THE MEASUREMENTS OF TRYPANOSOMATA.

Lingard, A., has given the name of *Trypanosoma longocaudense* to a new species of trypanosome met with in the blood of the white-bellied house rat (*Mus niveiventir*) whose habitat is the lower Himalayan ranges. The trypanosome in question was also found in one instance in *Mus decumanus*, and some other varieties of rats, apparently hybrids. The *T. longocaudense* was never found alone in the circulation, but always concurrently with some other well-recognised species of trypanosome. The chief pecu-

liarities of the new trypanosome are: (1) The inordinate length of the posterior extremity; (2) the thread-like sinuosity of the posterior extremity of the body; (3) the abrupt end of the body anteriorly; (4) the distance of the blepharoplast from the posterior extremity of the parasite. The organism can progress with either extremity forward.

Lingard's points of measurement for trypanosoma are:—



(*a*) Posterior extremity; (*b*) blepharoplast; (*c*) nutritive nucleus; (*d*) end of body protoplasm; (*e*) free flagellum.

(II.) Observations on Bilharziosis among Animals in India.

Montgomery, R. E., describes a new species of schistosomum under the name of *Sch. indicum*, which he found in the horse and in the donkey. He gives a full description of the male and female parasite, and the anatomical lesions they cause.

(III.) Trypanosomiasis in the Camel.

Pease, H. T., deals with this subject, under the name of Tiliarsa surra (Tiliarsa, *i.e.*, three-year disease, is one of the many local names bestowed on surra disease), at considerable length. He considers that the surra of camels is caused by the conveyance of trypanosomes from infected to healthy camels by bites of the Tabanidæ.

(IV.) Through what Agency is the Trypanosoma Evansi Carried from one Surra Season to Another?

Lingard, A., points out that equine surra appears during the rainy season (June and July) in Bombay, declines during the cold season, and reaches the minimum of prevalence during January and February, and then totally disappears for a few weeks. Equines (horses, donkeys and mules) all succumb to the spontaneous and inoculated forms of surra, but domestic bovines are capable of resisting spontaneous and inoculated trypanosomiasis (*T. evansi*), and of carrying the parasite in their blood for periods exceeding a year when derived from previous cases of spontaneous equine surra. It would seem, therefore, that by these bovines surra infectivity is carried over from one season to another.

"Archives de Médecine Navale," February, 1906.

Eradication of Yellow Fever in Havanna.

Le Méhauté, Dr. (French Navy), in the course of his medical notes on the places visited during the late cruise of the French Naval Training Ship *Duguay-Trouin* to the West Indies, gives a clear and concise history of the eradication of yellow fever in Havanna, and a brief but excellent description of the organisation of the Sanitary Services—both land and maritime—of the Island of Cuba. The results of the adequate prophylactic measures taken show that yellow fever has completely disappeared from Havanna, that small-pox no longer exists there, and that the mortality from malaria has gradually decreased from 1,907 in 1898, and 909 in 1899, to 151 in 1903; furthermore, that the general mortality of the island has also been diminished, thus showing how the sanitary conditions of a country may become ameliorated under the combined action of good hygiene and judicious prophylaxis.

Malarial Infection and its Treatment.

Gros, H., Dr. (French Navy), here completes his able and careful practical study of malaria, which has been running through several recent numbers of these Archives. He now describes the treatment of chronic malaria and the methods of prophylaxis to be adopted, and lays down the lines for future preventive sanitary legislation against malaria.

On the Present Malarial Epidemics of the High Plateaux of Madagascar.

"Apropos des épidémics palustres actuelles des hauts plateaux de Madagascar." By Dr. Fontoynont, Professor at the School of Medicine, Antananarivo, D.T.M., Paris.

In the last quarterly issue of the *Revue de Médecine et d'Hygiene Tropicales* for the period ending December 31st, 1905, Dr. Fontoynont states that the belief that endemic malaria was severe on the coast-line, but essentially benign on the high plateaux, was formerly a correct one, but that nowadays this is no longer the case, and that it must be confessed that the arrival of the French in Imerina has been the starting point for deadly malarial epidemics, which for several years have shown no tendency to diminish. One fact is always at once noted by an impartial observer, and that is that malaria has not increased in severity in equal proportions amongst the natives and Europeans. Whilst the mortality is stationary—and even decreasing—with the victors, it shows, on the other hand, a very marked increase amongst the vanquished enemy.

A second fact is the progress made by endemic malaria, which is yearly advancing to the eastward, describing an ever increasing and approaching curve round Antananarivo.

How can we account for this? By two factors which, united, have reacted on each other, but which, isolated, would not have produced the same results. The first is due to the large numbers of the people who had to leave their homes and emigrate to the unhealthy regions along the coast; they there acquired malaria, and on returning afterwards to their own villages transmitted—through the intermediate agency of mosquitoes—their hæmatozoa to those inhabitants who had stayed at home. The second is the dissemination of the germs, mainly due to the Malagassy custom of "Night-guards"; in every village, at night, a number of able-bodied men, in due proportion to the number of inhabitants, are obliged to pass the night outside their dwellings in order to watch over the public safety, and to prevent attack by armed marauders; these men, wearing only a cloth garment, with their beacon light, are the marked-down prey for countless swarms of mosquitoes; and as every man must take his turn at this night duty and offer himself as a resigned victim to the bites of the Anophelina, the most practical way of propagating malaria is thus ensured—almost with the facilities of a mere laboratory experiment. In those regions where the night-guard has been put down, and where the population has not moved, malaria has remained absent, although it was on the increase in the neighbourhood. Antananarivo formerly had few mosquitoes, consequently it had little ague, but when the mosquitoes became more abundant, malaria increased; this increase was the natural consequence of a large portion of land in the very heart of the city having been expropriated for the site of a future railway terminus; this land has ceased to be cultivated, became water-logged, and afforded splendid breeding places for mosquitoes, which now began to swarm; this was soon followed by a rapid rise in the number of malarial cases, with an increasing death-roll from this cause. The conclusions to be deduced are obvious, as are also the remedies, which, to economise space, are not here reproduced (J. E. N.).

Notices to Correspondents.

1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the Journal of Tropical Medicine should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communications.

NOTES ON DISEASES MET WITH IN SOUTH SYLHET, INDIA.

By A. B. Dalgetty, C.M., M.D., D.P.H.

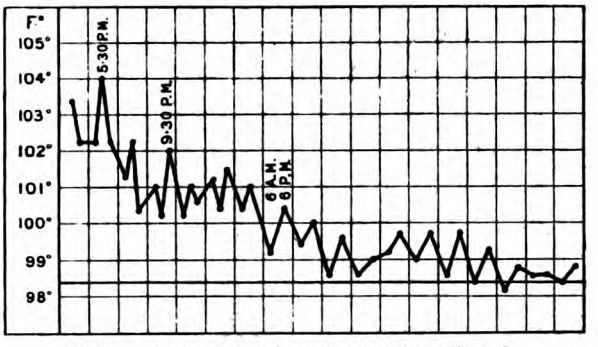
Malarial Fever, Quinine and Pregnancy.—The pregnant woman is, perhaps, not more liable to malarial fever than other people, but when she does become infected the attack is apt to be more severe, and relapses are more frequent than in others, a condition which increases the strain of pregnancy and leads to anæmia and a general low state of health. If the patient is left untreated, or if she refuse treatment, as many of the natives of India do, believing that all drugs are detrimental to the unborn child, miscarriage often occurs, either from the high temperature produced by the fever, or from the severe anæmia with its cardiac trouble and consequent dropsy.

But even in cases where repeated attacks of fever have taken place during the period of pregnancy, and have gone on right up to the time of delivery, it is remarkable how little the infant seems to have suffered thereby; as a rule, it is well nourished and normal in every respect, and, fortunately, is not born infected with the *Hæmamœba malariæ*. This fact, of the arrest of the *materies morbi* of malarial fever by the placenta is a wonderful thing, and shows that the placenta must act like a fine filter, allowing fluids to pass, but keeping back all particulate matter. It is suspected that occasionally the fœtus may be attacked *in utero*, and it is sometimes stated that infants a few hours old have shown recurrent rises and falls of temperature that appeared to have a malarial origin, and since the period of incubation would be too short to allow of a post-natal infection, one is forced to conclude that the infection took place before birth; but such cases are rare, and would seem to require further observation to confirm them, although it may well be that a placenta, damaged in some way, might allow the parasite of malaria to pass from the mother to the child.

These cases of pregnancy, complicated by malarial fever, frequently cause anxiety to the medical attendant, who fears for the safety of the mother if the fever continues, and who hesitates to give quinine for fear of causing abortion. This belief that quinine should be given very sparingly to pregnant women is widespread, and some practitioners would even withhold it altogether and treat the fever with antipyretics only; but it seems to me that the danger of producing a miscarriage by giving quinine is very much exaggerated. I hold that quinine should be given in doses sufficient to control the fever, whatever the quantity required may be, and that there need be little fear of anything untoward happening. On the contrary, one sees cases where timidity in the use of quinine may be legitimately charged with the occurrence of dangerous or even fatal symptoms in the mother, or the birth of a child immature, or showing chronic brain trouble. I have given quinine during four months in doses of from 5 to 15 grains in the twenty-four hours without any untoward result, and I believe that it is only within the last ten or fourteen days of the end of pregnancy, when uterine contractions are normally beginning to occur, and the cervix is beginning to become obliterated, that quinine may tend to stimulate these contractions; but by this time no harm will follow, even though labour be started a day or two earlier than otherwise it would have been. Pharmacology teaches that the action of a full dose of quinine upon the cardiac muscle and ganglia is to diminish the force and frequency of systole, and to lower the blood pressure, effects which, if they may be applied in the case of the uterus, would suggest a retarding rather than an accelerating influence on that organ.

Malarial Fever during the Puerperium.—The strain of parturition is apt to bring on an attack of malarial fever in a subject who has been previously infected. A febrile disturbance within the first few days after delivery always makes the medical attendant anxious, and it is a relief to know that there may be a considerable rise of temperature without serious import in a patient known to be subject to attacks of malarial fever. The following case is of some interest in this respect:—

Mrs. S., primïpara, confined at 4.30 a.m., no nurse nor doctor present. Pains came on two hours previously; birth easy, child small, no laceration of



Pulse not over 80, and respiration not affected.

maternal passage. When seen at 6.30 a.m. placenta not yet delivered, but lying loose in upper part of vagina and easily removed; condition of mother and child normal, breasts contained a little milk. On the second day the temperature began to rise, and there seemed to be a little more tenderness over the uterus than usual, but the lochial discharge was natural and free from odour, and the general condition of the patient was very good. A douche of carbolic (1-100) was now given twice a day as a safeguard, although the fever was not considered to be due to sepsis, and five grains of quinine every morning. In spite of this the temperature kept up, one day reaching 104° F., and continued with irregular remissions for about a fortnight. But during all the time the patient's general condition was very good; she could eat and sleep well, her milk came, the lochial discharge remained sweet, and the involution of the uterus was not checked. I had treated her for several attacks of malarial fever during her pregnancy, and undoubtedly this was a recrudescence of that fever brought on by parturition. The slight uterine tenderness that appeared to be present may have been caused by the fever, for I have noticed as an early sign of an impend-

ing attack of malaria that joints and muscles which had been much in use shortly before, such as the adductors of the thigh in riding, or the elbow or shoulder in tennis, were the first to ache and were more tender to the touch than other parts. The character of the temperature chart is not much help in cases of malarial fever occurring in those who live in the Tropics, for it is rarely typical, being interfered with by the frequent taking of quinine and other causes.

A Case of Chyluria.—A coolie, Sakramuni, had been on the same garden for several years, and was to all appearance in usual health, when suddenly he began to pass milky-white urine. There was no difficulty in micturition, no uneasiness about bladder, no abdominal pain, and his general condition was as good as that of his class. Physical examination disclosed nothing of note; there were no enlarged glands, the spleen could not be felt, there was no abdominal tumour, and the temperature was not raised. The urine varied in milkiness from time to time, being usually clearest in the morning, but never free from it all together. It was opaque, milky-white in appearance, deposited a thick curd-like layer half the depth of the glass, with

Sketch of Filaria Embryo, × 300, lying in midst of granular, fatty cells in urine.

Oval body in urine, possibly a developing filaria ovum.

a thinner, more opalescent layer above, alkaline in reaction and contained much albumin. There was no tinge of red in it. Microscopically it was seen that the urine was crowded with masses of highly refracting, round, granular cells, like lymphocytes, which varied somewhat in size and mostly cleared up on treating with ether; no red blood cells were seen. Naturally, one was on the look-out for the presence of filariæ in the urine, but I examined a good number of films before I succeeded in finding one. The specimen found was slightly damaged towards the head, but otherwise was quite distinct and unmistakeable, but I could not determine to what species it belonged. It was, of course, not alive when examined, as the specimen of urine had been passed several hours previously.

The foregoing drawing shows the parasite, multiplied about 300 times, lying in the midst of the granular, fatty cells.

The elongated, oval body outside the drawing was also seen, but what it represents I do not know, unless it be a developing ovum. I have not seen a drawing of the ova of the filaria in any of the books on the subject, so I may be wrong.

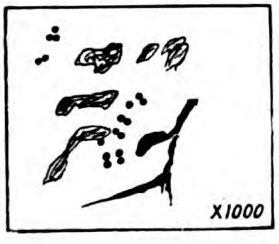
The patient went on in much the same condition, able to do his work, and showing no other signs of filarial infection for eight months. Blood films taken at this time failed to discover any filariæ in the blood either by night or day, but there was an excess of eosinophile corpuscles, as many as 11 per cent. on one occasion. At the beginning of July the urine began to be much clearer, although it still contained albumin and the same granular lymphocytes as before; and now there appeared a well-defined, lobulated swelling, occupying the right iliohypogastric region, slightly tender and giving an impression of fluctuation on deep pressure. His general health also began to deteriorate, he had fever, constipation and a foul tongue, and the blood showed a slight increase of leucocytes. An exploratory operation was suggested to the patient but his friends would not consent, so he drifted on, gradually becoming weaker, and died three weeks later of exhaustion; diarrhœa set in at the end and the urine was said to have become blood-stained. No *post-mortem* examination could be obtained. Whatever the actual pathological condition was, it would seem that the communication between the lymphatic system and the urinary channels became blocked, or nearly so, thus leading to an improvement in the condition of the urine, but being at the same time detrimental to the general condition of the patient. The lobulated tumour that developed was the result of this blocking, and probably was an enormously distended lymphatic varix, or a mass of enlarged deep iliac or sacral lymph glands. It may be mentioned that filarial disease in any form is very rare in tea-gardens in Sylhet, at any rate, the grosser manifestations, such as elephantiasis, lymph scrotum, and the like are hardly ever seen, but it may exist in masked forms, such as the condition known as circumscribed œdema of the extremities described by me in this Journal, October, 1900, and suspected to be caused by a filaria.

Cerebro-spinal Meningitis.—Hirsch, in his handbook, in 1886, says that hitherto this disease has been confined to temperate and subtropical latitudes, and that the Tropics and the Southern Hemisphere have escaped altogether. Since that time several outbreaks have taken place in different parts of the world, and notably during last year in the United States of America, but still the disease seems to remain restricted to much the same limits as Hirsch described at that date. As regards India, I have never seen any account of this form of meningitis having arisen as an epidemic, but that isolated cases do occur from time to time I think there is no doubt. At intervals during the past four or five years I have met with obscure cases which presented many of the signs of cerebro-spinal meningitis, such as muscular rigidity, retraction of the head and a deepening coma, always ending in death, but as they were always a good way off one had few chances of seeing them or of following up their history in a

satisfactory manner. The more acute symptoms of the onset and early stage of the disease are usually over before the patient is seen, and the thing that strikes one most about these cases is that they look seriously ill without evident cause; the temperature may be only slightly above normal, the pulse is slow rather than fast, there is neither cardiac nor pulmonary trouble, diarrhœa and vomiting are unusual, the absence of a wound excludes tetanus, and the symptoms are not those of sunstroke or cerebral apoplexy, yet the patient looks dangerously ill.

Not long ago I met with a less acute case which gave me a better opportunity of following up the history and the course of the disease.

Liloo, a Hindu woman, had been ill for ten days when I saw her on July 22nd, the chief complaint being severe pain in the occipito-spinal region, difficulty in walking, and general weakness. She was dull and apathetic, speech slow, pupils equal, temperature 100° F., could stand only with help, had tremors of the leg muscles, no paralysis; heart, lungs, and abdominal organs normal. Four days later the symptoms were more marked; the right arm and leg showed greater stiffening than the left, sensation in these parts was diminished, and the right knee-jerk was absent, but there was no facial paralysis and no retraction of the neck. An attempt was made to get a drop of spinal fluid, but without success at this time. Blood films did not show leucocytosis. On August 5th further developments had taken place: the patient was now semi-comatose, the head was drawn backwards and slightly towards the right shoulder, the eyes were turned upwards, outwards, and to the right, there was tightness of the hamstring muscles, but Kernig's sign was not well marked, pulse slow and very weak, respiration shallow, there was no rise of temperature, and I did not notice a skin eruption. There was tenderness along the spine, as shown by the patient shrinking when the skin was being disinfected for lumbar puncture. On this occasion I succeeded in getting a few drops of cerebro-spinal fluid. Under the microscope this showed a few flakes of epithelium, and in two specimens several micrococci were discovered; these lay together either in groups of two or groups of four amidst some particle of broken-down cells; they were rounded or oval in shape, and when stained with methylene blue had a clear space round them, but no definite capsule. I had no Gram's stain available to try its effect.



The patient gradually sank, and died on August 9th, four weeks from the beginning of the illness. A *post-mortem* examination was not made.

I have short notes of four other cases, of which two were boys, one a middle-aged man and one a young man; all were fatal, and all had the cardinal signs of this disease—sudden onset, marked depression, pains in spine, retraction of head, stiffness of muscles, ending in coma and death within a few days. In one only was the temperature high, it reached 106° F. shortly before the end.

One would like to follow up such cases as these more closely, but the lack of opportunity of seeing more of one's patients, owing often to the long distances to be traversed and the trying circumstances surrounding work in the Tropics, will be readily understood by all who have practised in hot countries.

Morbus Maculosus Neonatorum. — The following seems to be a case of this rather uncommon disease. An infant, three days after birth, developed bleeding from the mouth and anus. When I saw it on the fourth day the hæmorrhage from the mouth had stopped, but dark red blood was still oozing from the anus. The confinement had been uncomplicated, and the child had not received any injury; it looked healthy and well nourished, and showed no signs of syphilitic disease, and there was no jaundice. There was no history of lues in the parents, and there were several more children in the family, all healthy looking. Liquid extract of ergot, in 3 minim doses thrice daily, was given, and the bleeding had ceased within ten days and did not recur.

Diet and Health.—It is a common cry of vegetarians and other food faddists that flesh food is not a necessary part of the dietary of man, and they point to the case of whole races who are said to subsist on a rice diet alone, and are yet able to preserve perfect health. Like many other general statements on subjects made by those who do not have a first hand knowledge of the facts, that statement is only partly true, and it may be of interest to record my experience among many thousands of tea-garden coolies, extending over a period of nine years, with reference to this point.

I shall take anæmia, which is a general result of of many different deleterious causes, as the test of health. Anæmia is a very common trouble amongst tea-garden coolies in many parts of Assam, and sometimes becomes so rife that it seriously interferes with the work of a garden. Women, of course, suffer more than men, probably on account of the stress of pregnancy aggravating the condition, and it is no unusual thing to see a woman well advanced in pregnancy unable to stand or to lie down, and reclining in a sitting posture, with feet and legs swollen, the abdomen half full of fluid, the hands œdematous, the face so swollen that she can hardly see, the conjunctivæ and tongue of marble whiteness, bruits all over the chest, and fluid at the base of the lungs, a condition, in short, that if not soon relieved must speedily prove fatal. Nature usually sends relief by causing abortion; gradually the dropsy becomes absorbed, and in a few weeks the patient has returned to her normal state—a state, however, which is always one of relative anæmia.

That is, of course, an extreme instance, but it is by no means an uncommon one, and there are all degrees of severity leading up to that; while the men suffer almost as frequently, if a little less severely, The causes of this anæmia are various, but I am not at present dealing with them. Now, a short

acquaintance with tea-garden labourers teaches one that not all races of coolies suffer equally, and here it may be noted that Hindoo coolies differ from one another in race and language as much as a Highlander from a Cornishman, or a Welshman from a man of Norfolk; one sees that the dark-skinned coolie, such as the Santhal, who spends all he earns on food and drink, and eats fish, flesh and fowl, almost never suffers from anæmia; while the fairer-skinned coolie from the North-West Provinces, who hoards up every pice he can get, lives on food almost wholly of a vegetable kind and shuns the flesh of animals like a plague, falls an easy prey to the disease whenever his small reserve of energy is exhausted by a trifling illness.

The conditions in which these two distinct types live are absolutely identical, and both are imported from a distance to work on the tea-gardens, so that both have to become acclimatised, so to speak; the only difference lies in the nature of their food. The strong, black coolie feeds well on a mixed diet and is hardly ever a prey to anæmia, while the other, who lives on a vegetable regimen, is nearly always below par, facts that would seem to support the proposition that man best maintains his strength on a mixed diet. I am quite well aware that these two types have probably had a very different origin, that the Santhals are, perhaps, an aboriginal race, and that the coolies from the North-West have very likely sprung from a mixed Aryan stock; but for many thousands of years both have lived and worked under the same Indian sun, and it seems to me that the great difference between them lies in the nature of their diet, and that this is sufficient to explain the presence and the absence of anæmia in the two races.

Medicine and Witchcraft.—One meets with many instances of the belief in witchcraft amongst the Hindoos, and the methods employed to counteract the supposed influence of evil spirits are very interesting, although it is often difficult to get at the bottom of the matter, because the people themselves are half ashamed of their superstition, and are afraid to say much about it for fear of being ridiculed. The following incident is interesting, for more than one reason. One night, during a sharp thunderstorm, the lightning had been attracted by a papya tree, about 12 feet high, which was growing near a native hut, and striking the ground entered the house and ploughed up a zigzag furrow across the floor of a room in which two men were sleeping. The lightning had passed within two feet of the wooden bed on which they lay and most of its force had been spent in the ground, but a portion of it had glanced aside towards the feet of the two men and passed up their bodies, having been attracted, possibly, by some empty oil tins that were standing near the head of the bed.

One of the men escaped with a little singeing of the hair on his legs and chest, but the other did not fare so well. The lightning had singed him, like the other, but had then struck the right side of his head, entered the ear and stunned him. When I saw him he was still in a dazed condition but quite conscious, was able to answer questions slowly, and complained of pain in the right ear; there was a slight oozing of blood-stained fluid from the meatus, and on throwing in the light it was found that the drum was torn across. There were no gross signs of brain injury apparent then or afterwards, but he continued in a depressed state for many weeks, though he was able to go about and seemed otherwise well. Now comes the witchcraft part of it, which probably explains a good deal of the melancholia from which he suffered. Although he and his friends were quite well aware that the injury was done by the lightning, yet in their own minds they connected that physical phenomenon with a demoniacal origin. They believed that an evil spirit, or "bhoot" as they call it, had taken up its abode within him, and they recollected that a short time before he had passed a burying ground on his way home one night, and the inference was easy that some ill-disposed spirit, lurking about, had found him an easy prey, and had taken advantage of his being asleep to enter his body in that forcible fashion. So, as it was desirable to expel this unwelcome guest as speedily as possible, and seeing that the doctor sahib did not believe in such supernatural visitants and could only treat natural effects by natural remedies, the patient's friends took council together how best to attain that end.

Accordingly, they hired the services of a band, composed of drums, cymbals, and other more or less noisy instruments, formed a circle round the patient, and then let loose their witch-compelling din. At the same time one of their holy men stuffed ghee, or clarified butter, into his ears, for everything that comes from the cow is pure and sacred, and held the victim's nose over a smoking lamp of incense in order to make his quarters too hot for the demon. The "bhoot," however, appeared to be in no hurry to quit, for this performance went on for many nights, and at the end of it the patient was no better than at the beginning. Finally, I heard that he went a good distance off to be treated by someone renowned as an exorciser of evil spirits, and that after a time he returned with a lighter pocket, if not with a lighter head.

The Evil Eye.—There would be many a sudden death if a look would kill, but, fortunately, it is not so, although the belief in being "overlooked" by the "evil eye" to one's harm is not dead, and is still met in places where one would hardly expect to find it. Among Eastern peoples it still strongly exists, and the following instances will show some of the means adopted by the Hindoos to avert this evil influence. When a person receives a cut on the leg or arm, or suffers from an ulcer, one of the first things he does is to tie round the limb a cord of twisted human hair, to which, very often, a small shell is attached. The purpose of this is to prevent the sore from spreading over the limb and over the body, thereby causing death, an event which he thinks would happen if some ill-disposed person were to "overlook" him with the evil eye whilst he is suffering from his wound. It is not easy to see what disenchanting virtue can lie hidden in a snail shell or a band of twisted hair, unless the comparatively long-lasting nature of these has something to do with it.

Here is another custom practised by some, the meaning of which is explained differently by different

people. The mothers apply a black dye or pigment round the eyelids of their infants after the child is old enough to be taken out. The black substance is said to be a natural earth dug from some of the hills, but I believe any black pigment will serve the purpose. The explanation of this practice varies; some say that it is only done for looks' sake, some that it is to protect the delicate young eyes from the strong light and the glare of the dry ground, while others admit that it is done to annul the intentions of any evil-minded person who might be envious of her neighbour's pretty child and overlook it for its harm. The first of these reasons is hardly sufficient, for their dark skin throws the white of the eye into sufficient relief without the artificial aid required for that purpose by the belles of the West. The second explanation, that it protects the eyes from the glare, has something to be said for it, for I have noticed in white dogs when one eye lies in the midst of a black or brown patch, and the other is surrounded altogether by a white ground, that the former eye is strong, and free from inflammation, while the latter is very often the seat of a chronic conjunctivitis. The greater amount of pigment in the skin of the dark patch seems to diminish the irritating effects of the light and glare. However, as the black eyes of the natives rarely suffer from this cause, the third explanation would seem, perhaps, to be the right one, namely, that it protects the child against the "evil eye."

Another example may be given. When riding about one often sees near a busti, or native croft, as it may be called, a clay cooking-pot with a few white lines and circles painted over its bottom, hanging mouth downwards high up on the end of a bamboo pole; this too, I believe, is intended as a protection against the "evil eye." The design on the upturned pot, which seems always to be an old one with a black bottom, is two white lines crossing one another, with a small white circle in each of the four triangles thus formed, a rough imitation, perhaps, of a human face with four eyes, and intended to attract the glance of the "evil eye," thereby diverting its malign influence from the house and its inmates: a spell, doubtless, not less potent than ours of hanging up a horse-shoe by the door-lintel.

A possible explanation of the origin of this practice has occurred to me. When the rice harvest has been gathered in the straw is built up in round stacks which have a pole running up the centre to keep them upright. Since these stacks are never thatched the heavy rains would get in at the top around the pole, and rot the straw, and to prevent this a small clay cooking-pot is put over the top of the pole, so that the rain is diverted all round. At the end of the year, when the straw has been used up, the bare pole is left standing with its hat at the top like a very tall mushroom with a very small head, and it thus forms a rather striking object, and in course of time it would probably occur to someone looking about for a prominent point of advantage whereon to inscribe his anti-charm that here was the very thing, so that by and bye the cymbal would be set up altogether independent of its original purpose.

The Scapegoat.—The old Hebrew custom of laying the sins of the people upon a goat and turning it adrift into the desert still exists to some extent among the Hindoos, who resort to this device in order to rid their family of illness. Since a goat is rather too expensive for a poor man's purse he utilises a chicken instead. The "bhoot" which is supposed to be the cause of the person's illness is exorcised into the hapless chicken, a red mark is then put on its forehead, and it is taken well out into the jungle and allowed to escape. The disease is expected to go with it, and its former owner feels no qualms of conscience to think that some innocent mortal happening across the "scapegoat" may become a new victim. But the danger therefrom cannot be very great, for I know a sahib who once stumbled over one of these escaped chickens, and, taking pity on it, put it in his pocket and brought it home, unwitting of the risk he was running, and he is yet alive and well. Another ingenious if equally unkind device to rid one's self of an illness and foist it on another is to set down a pair of wooden shoes belonging to the patient hidden from sight at a point where two paths meet. Strings are fixed to the shoes and to wooden supports at the sides of the road, so that the first person coming along steps into the trap, the threads break, and the patient is cured of his disease at the expense of the newcomer. It is chiefly during epidemics and in long illnesses that resist medical treatment that belief in demoniacal possession gains the upper hand of the people, and compels them to resort to charms and incantations; at other times they are quite ready to seek the help and carry out the methods of modern medical science.

THE ANATOMY OF THE BITING FLIES OF THE GENERA *STOMOXYS* AND *GLOSSINA*.

By Lieut.-Colonel G. M. Giles, I.M.S. (Rtd.).

(*Continued from p.* 156.)

Of the pseudo-tracheæ of the "tongue" of the commoner flies I have as yet discovered no trace, but behind the leaf-shaped blades are two other rows of five strongly chitinised teeth of nearly as large size as those first described. Of these the one next to them has teeth with ends like that of a cheese-cutter, while the innermost has a point curiously serrated on one side, and a number of short, stout, intensely black-blue bristles may be also added, but a complete description of this wonderful structure would exceed all reasonable limits. To conclude the description of the labium, it will thus be seen that, though somewhat stiffened by its median sclerite, it is quite without any basal support, as the median sclerite tapers away to nothing at the base, and the external integument, though deceptively dense to external appearance, is really soft and flexible, and specially creased to admit of its being shortened in the same way as an accordion.

If we now turn to the upper lip or labrum, we find a structure formed exactly on the model of a hypodermic needle, and in every way as admirably adapted for piercing as the labium is obviously impossible for such a function. It differs from the familiar surgical

instrument only in the detail that the tube is incomplete, a narrow slit running along its entire ventral surface to the point, where it expands, so as to make the organ end in a point, like that of a pen. It forms, however, fully three-fourths of a complete tube, and the remaining fourth, as will be seen by reference to fig. 16, is completed by the dorsal surface of the hypopharynx. It must be remembered that all members of the fly family are provided with a similar apparatus, the difference being merely one of relative length.

Though in reality continuous with the delicate membrane that at first forms the upper wall of the tubular buccal cavity, the dense chitin of which it is composed ends abruptly at a line a little before the base of the labium, and its two corners articulate with a pair of sclerites, named by Lowne the apodemes of the labrum, which in their turn articulate with two cornua projecting forwards from the chitinous skeleton of the cephalo-pharynx, called the fulcra by the same writer. These apodemes are rod-like structures, which closely resemble the human clavicle in form; and the fulcrum is a hollow frame of chitin of rather curious form. Behind it may be taken as continuous

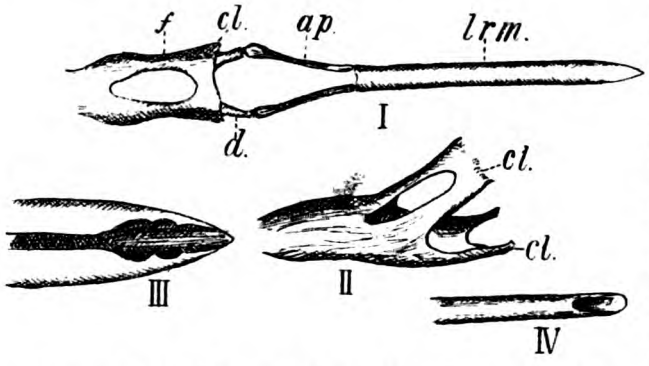


FIG. 19.—I. Semi-diagram showing the chitinous skeleton of the labrum, or upper lip: *ap*, apodeme of the labrum; *cl*, chitinous plate uniting epistome with the clypeus; *d*, distal cornua of fulcrum; *f*, fulcrum; *lrm*, labrum. II. The fulcrum drawn in perspective. III. Point of labrum; and IV., end of hypopharynx at the same higher magnification.

with the pharynx, but in front the sides are open, while the dorsal and ventral aspects are prolonged as two plates, the upper one of which turns upwards to fuse with the clypeus, and so affords an immovable connection with the chitinous exoskeleton for the front of the head. This plate is pierced by a large foramen which gives passage to the nerves and tracheæ of the trunk, and also for an air chamber continuous in front with those of the labium and behind with those of the head and of the body generally. The lower plate, on the other hand, is shaped much like the half of a butcher's tray, the handles of the tray being represented by the two cornua which again articulate with the proximal ends of the apodemes. The labrum is therefore connected with the skeleton of the head by the intervention of two joints, movable only in flexion and extension, and each capable of being moved or fixed by appropriate muscles. The point of the labrum is bevelled, and the edges of the resulting pen-like structure are each armed with two keen but not very trenchant teeth of such a form as to equally facilitate rapid withdrawal and insertion. When in function the slit in the ventral aspect of the tube is closed by the apposition of another structure, the hypopharynx. This springs from the floor of the mouth, level with the base of the labrum, and is a prolongation of the salivary duct. It consists of a delicate but fairly stiff tube, the dorsal side of which is produced laterally to form two alæ, which curve backwards in such a way as to form a fairly deep groove on its dorsal side. Seen in section (fig. 16, *h*), it is seen that the tube is comparatively small in proportion to the thickness of the walls, but it must be endowed with considerable elasticity, as was shown by a curious accidental experiment.

I had placed an entire insect in water (from spirit), with the view of dissecting the proboscis, and had spread apart its three components, when, under my eyes, the hypopharynx began to swell and lengthen, till it protruded a long way beyond the labella, and at last it snapped in the middle, after which the pieces rapidly resumed their original size. The orifice of its tube, I conclude, was in some way obstructed, and osmosis had done the rest. Sections of the entire proboscis show that the alæ fit into a curious slot in the edges of the labrum and so convert it into a complete tube through which the blood is drawn into the œsophagus.

The arrangement recalls in many ways that whereby the outer case of a cycle tyre secures itself to the rim of the wheel, which in this case is represented by the hypopharynx, but is designed to make the resulting tube withstand not positive, but negative pressure.

As already indicated, I do not believe that in *Stomoxys* the labium has any share in piercing the skin, but that it acts as a protective sheath to the more delicate lancet, and supplies the muscular force whereby the latter is driven into the skin. This, the writer believes, is effected in the following manner: By means of the various hooks and blades of the labella it attaches itself to the skin of the animal to be operated on, and then by a contraction of its powerful longitudinal muscles forcibly shortens itself, so that the labrum is made to protrude and, guided by the labella, is thrust into the skin. With a little trouble it is possible to imitate this in a fresh fly to some extent by handling the labium with the needles so as to make it lengthen and shorten. As there is no bending out of the way of the labium, such as occurs in the mosquito, it appears to the observer exactly as if the labium itself had entered the skin; the illusion being something on the principle of the stage dagger.

It must be remembered that the parts are none too large, and that any one attempting to watch the process cannot put his head too near, for fear of disturbing the fly, added to which, when animals are bitten, the fur further interferes with the possibility of seeing exactly how the operation is performed. To watch the process to any purpose would require the use of a powerful hand lens, and this is, of course, out of the question.

From the comparative point of view, the anatomy of the proboscis of *Glossina* closely resembles that of *Stomoxys*, but differs remarkedly in many details. At

their bases, the resemblance between the two proboscs is fairly complete, and the foregoing description of the chitinous skeleton of the mouth-parts might here stand almost as well for those of *Glossina*, but here the resemblance ends. A very cursory examination shows that the visible parts of the proboscis

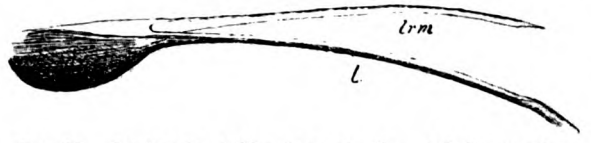


FIG. 20.—Proboscis of *Glossina palpalis*. *l*, Labium; *lrm*, labrum.

(labium) consist of two distinct parts, a large basal bulb, as thick or thicker than the base of the labium of *Stomoxys*, and a long, extremely slender rod ending in a blunt end, slightly bent backwards, so as to form an instrument exactly like a French urethral bougie. This slender part is densely chitinised and hence very stiff, but the bulb has a thin flexible integument like that of the other species. Moreover, the pair of large muscles which largely fill up the bulb, instead of remaining muscular nearly to the end of the proboscis, terminate in two delicate tendons which run through the entire slender portion to be inserted into the base of the labella.

The form of the hypopharynx and its relations with the labrum are entirely different from any other fly I have examined, and conclusively show the correctness of the general opinion that the entire slender part of the proboscis is introduced into the wound in the skin.

In *Stomoxys* and the other flies as yet examined by me, the apposition of the labrum and hypopharynx forms a tube through which the food of the insect is conducted to the œsophagus, but between these two parts in *Glossina* there is no tube, because the apposed parts are moulded to exactly fit each other.

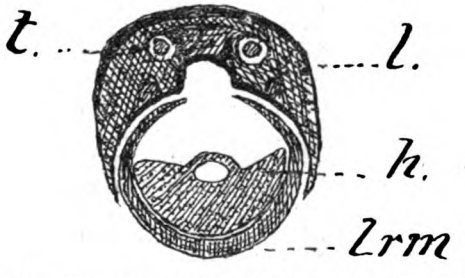


FIG. 21.—Tranverse section of the proboscis of *Glossina palpalis* at almost mid-length. *h*, Hypopharynx; *l*, labium; *lrm*, labrum; *t*, tendons of the contractor muscle of the bulb enclosed in tubular chitinous canals in the substance of the labium. *Note*.—The ventral side of this figure is uppermost.

As will be seen from the figure, the hypopharynx is a solid rod of semilunar section, with a rib running down its flat ventral face within which is the salivary canal. The convex dorsal side fits closely against the labrum, which is wrapped round it, the edges of the latter extending beyond its own, and inverted so as to form quite five-sixths of a complete tube. In somewhat similar manner the labium is wrapped round the labrum, the edges of the former overlapping those of the latter for quite a quarter of the circumference of the tube formed by their apposition. The slot on the dorsal surface of the labium therefore forms rather more than half a circle, and opposite the slit between the edges of the labrum runs a minor groove of the same width. Both walls of the labium are very thick and densely chitinised, especially in the middle line, and it it further strengthened by infoldings of chitin which support the sheaths of the long tendons of the contractors of the bulb.

The thickness of the slender part of the proboscis is less than 0·04 mm., and its length 1·4 mm.; that of the bulb 0·57 mm., and that of the part of the labium that projects beyond the labrum in the position of rest 0·17 mm.

An examination of the above drawing (fig. 20), however, shows at once that the labium, with its blunt, bougie-like end, is quite unsuited for piercing the skin, while the labrum is eminently adapted for doing so. A shortening of the length of the bulb by even a third of its length, through the action of the powerful contractor muscles, would suffice to bring the cutting point of the labrum beyond the blunt end of the labium; and assuming the latter to be fixed to the skin by means of the jagged teeth of the labella, would enable the former to make a wound into which the labium could be introduced like a probe. Once introduced, a sawing alternate action of protrusion and retraction of the labrum would enable the entire apparatus to penetrate to its full depth with comparative rapidity, as the mouth of the wound would be at the same time enlarged by the saw-like edges with which, it will be noticed, the sides of the labium are provided. The labella are smaller and certainly much more rigid than in *Stomoxys*. Judging from spirit specimens, one would say that they were anchylosed to the trunk of the labium, but probably in fresh specimens they can be separated to a moderate extent. Hausen's description and figure of the labella in Mr. Austen's monograph of the tsetse-flies appears quite accurate, and as he suggests that some part at least of their armature is brought into action by the protrusion of the elastic membrane carrying them, it seems probable that he also regards the labella as capable of but little separation.

In the position of rest the united ends of the labella form a perfectly smooth, probe-like instrument, as the somewhat complicated armature of teeth and blades, with which they are provided, are entirely hidden between them. Even when protruded, however, it is difficult to imagine any method by which they could effect a wound large enough for the organ on which they are carried to follow them.

We will now proceed to some description of the organs contained within the head.

In the middle line, just above the roots of the antennæ, will be seen a minute foramen. This is the opening of a rather extensive cavity which extends backwards under the vertex nearly half-way to the occiput, and is nearly as wide as it is long. It has also a considerable depth, and from its floor two large median processes project into its interior, besides which there are sundry median and lateral diverticula. The whole cavity has a dense chitinous wall, and is closely beset with short conical hairs. The presence

of this cavity gives rise to appearances somewhat difficult to interpret in section, unless one is aware of its existence. This cavity is the inverted frontal sac, and in the pupa is everted to form a large bulla, by means of which the operculum of the pupa case is burst open to admit of the escape of the imago, but it does not appear to serve any function in the latter, so that its significance is entirely developmental.

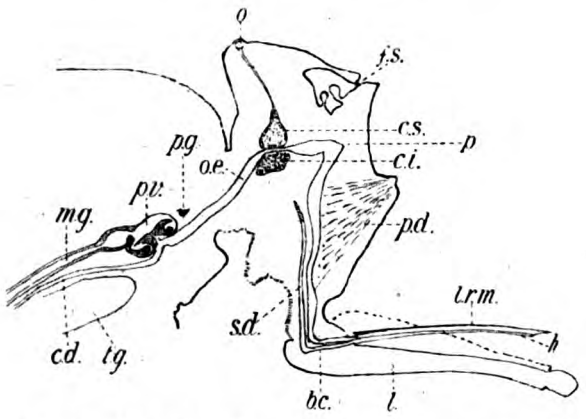


FIG. 22.—Vertical section of head of Stomoxys, semi-diagrammatic. *bc*, Buccal cavity; *cd*, duct of crop; *ci*, subœsophageal cerebral commissure; *cs*, supra-œsophageal cerebral commissure; *h*, hypopharynx; *l*, labium; *lrm*, labrum; *mg*, midgut; *o*, ocellus and its nerve; *oe*, œsophagus; *p*, pharynx; *pd*, dilatator muscle of pharynx; *pg*, proventricular ganglion; *pv*, proventriculus; *sd*, common salivary duct; *tg*, thoracic ganglion.

The buccal cavity is contained in the base of the proboscis, its anterior boundary, where the hypopharynx springs from the floor of the lower wall, being opposite the thickest part of the bulb. It is quite a narrow cavity, and is strengthened by transverse chitinous fibres, and it may be said to end and the pharynx to commence at the point where the soft flexible root of the proboscis begins. From this point the pharynx runs nearly vertically upwards in the axis of the head to a point opposite the middle of the large second antennal joint. Here it becomes the œsophagus and bends sharply backwards, in the longitudinal axis of the insect, to pierce the cerebral commissure, narrowing to an extreme tenuity, and then runs backwards and downwards through the neck to the under-surface of the proventriculus.

The pharynx is the true aspiratory organ by means of which the blood of the victim is sucked. It is of considerable size, being a quarter of a millimetre across at its widest part; but in the position of rest is a mere slit, the anterior and posterior surfaces being in contact. The slit is not, however, straight, but nearly semilunar, with the convexity backwards.

The concave ventral surface is formed of a dense plate of chitin, and is practically immovable, though it is steadied by a pair of lateral muscular bands. The anterior or dorsal surface, on the other hand, is soft and flexible, and inserted into it on either side are the powerful dilatator muscles which spring from the interior of the ridge which bounds the recess below of the hollow in which the antennæ lie.

When these muscles contract they must necessarily draw forward the flexible anterior wall of the pharynx; and as, from its density, the posterior wall cannot follow, it must needs convert the closed slit into an open cavity of oval section. In some respects the arrangement resembles that of the Culicidæ, but in them there is a localised elastic bulb which can be, like the pharynx of *Stomoxys*, actively dilated; but in that genus there can be no elastic contractility, and the return to the slit form of lumen must be through the agency of the pneumatic pressure of the great air sinuses with which the organ is surrounded.

In the above figure of a median sagittal section, the dilatator of the pharynx should, strictly speaking, not be represented, as there is a considerable interval in the middle line between the two planes of muscle, but to save an additional figure their direction is indicated by broken lines. The transverse section here

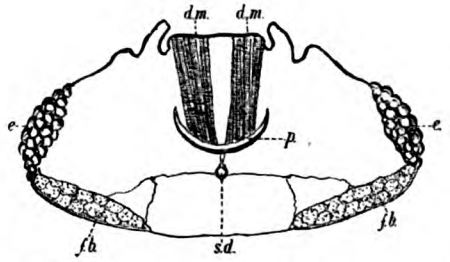


FIG. 23.—Horizontal section of head of Stomoxys. *dm*, Dilatator muscles of pharynx; *e*, lower edge of eyes; *fb*, fat body; *p*, cavity of pharynx; *sd*, salivary duct.

depicted will, however, serve sufficiently to indicate the true position of these muscles.

When piercing the transverse cerebral commissure, the œsophagus contracts to a lumen of no more than 0·015 mm.; and behind it the tube again dilates, but is compressed instead of depressed. The common salivary duct, from its origin at the base of the hypopharynx, follows the course of the buccal cavity and pharynx, at a little distance from it ventrally, and ends by dividing into the right and left ducts at a point about level with the apices of the antennæ. This is a good deal further back than as indicated by Hansen, and still more in contrast with the bifurcation in Glossina as stated by Prof. Minchin. Hansen (fig. 21, pl. 8, of Austen's monograph) also figures a large salivary reservoir.

It may be gathered from the context of his memorandum that he relied on his interpretation of the parts as seen in optical section through the integuments, and this probably accounts for the illusion, for the writer has no hesitation in stating that no such dilatation exists, as the duct has been followed in an unbroken series of sections from the hypopharynx to its bifurcation at the point indicated, and it nowhere exceeds 0·02 mm. in diameter. As far as can be made out, the spiral fibre which strengthens the duct in many diptera is wanting here. Shortly after entering the thorax the ducts cease to be chitinous and become glandular. In fig. 22 the size of the duct is intentionally exaggerated so as to make its position clearer.

The salivary ducts, after division, run together in

contact, close under the soft ventral integument of the head to the neck, and so do not follow the stomodeal canal, which is, however, accompanied in its passage through the cerebral commissure by a pair of tracheæ of about the same calibre as the salivary ducts, and by two nerve fibres.

Speaking generally, the anatomy of the head of *Glossina* appears to coincide closely with that of Stomoxys, but Prof. Minchin notes that the salivary ducts bifurcate further forwards. The most striking point about the brain of these and other flies is its large size, which must be relatively considerably larger than that of most of the lower vertebrates. There do not appear to be any details of special interest in the brain of either Stomoxys or Glossina, and as a large number of papers are easily available on the dipterous brain, any further description is quite superfluous. A very excellent account will be found in Lowne's work on the Blow-fly vol. ii., p. 453, and a shorter statement in Prof. Minchin's paper on Glossina in the *Proc. Roy. Soc.*, vol. B., 76, p. 532. Before quitting the head it may be well, however, to add a few words on the histology of the principal organs.

(*To be continued.*)

THE PURU OF THE MALAY PENINSULA.

By T. D. Gimlette, M.D.[1]

(*Continued from page* 153.)

The Varieties and Complications of Puru.

Malays distinguish the varieties of many of their diseases by a number of clinical names. For example, small-pox, which is common among them, has been given—under the name of "penyakit ketumbohan"—no less than eleven different descriptive names, according to the appearance of the pustules. Again, the average intelligent Malay will recognise at least seven different varieties of ringworm. Puru is divided in the same way into several varieties, the chief of which are: "Puru siput" or "puru kechar" ("siput" and "kechar," a shell); "puru mata kerbau" or "puru kerbau" ("mata," an eye; "kerbau," a buffalo); "puru sekam" or "puru dedak" (chaff or bran); "puru kretas" (paper); "puru kochi" (Cochin China sore); "puru tapak anjing" ("tapak," a footprint; "anjing," a dog); "puru pitis" (a small coin); also "puru parang" ("parang," a chopper) and "puru kenam." Puru of the foot is generally known as "bubol," but it is frequently referred to in Kelantan as "puru duriyan." "Bubol" has been somewhat fancifully divided into "bubol sarang" ("sarang," a nest); "bubol malai" (aigrette); "bubol susoh ayam" ("susoh," a spur; "ayam," a chicken), and "bubol bubok" (bubok," a wood maggot).

Of these Malay varieties, "puru siput" is characterised by its rupial-shaped sores, and is perhaps the most common. It is considered to be the most benign form. It is not painful, and the sores heal easily. An example of "puru siput" is shown in fig. 1.

"Puru mata kerbau" is common. The sores are very large, but heal readily. Kelantan Malays call this the real puru. It may be combined with "puru pitis."

"Puru sekan" is especially irritable with regard to itching.

"Puru kretas" is distinguished from other forms of puru by the general superficial character of the eruption. It is only skin deep, gyratory, very painful, and difficult to cure. It is the worst kind known and may cause death. It may be combined with "puru mata kerbau."

"Puru tapak anjing" is another bad kind of puru. It is very painful, and leaves large, though insignificant, scars, either similar to a dog's footprint or very irregular in shape. The sores are supposed to occur on the body, placed in the way a dog leaves marks after walking on the sands—here some and there some, and none in the middle.

Puru kochi has been mentioned under etiology. It is referred to in an old Malay dictionary as the venereal disease [16]. "Puru kochi" is said to be chronic. It is not considered fatal, although no native medicine will cure it. It is also called "puru glang besi" (glang, lit. a bracelet or anklet; besi, iron).

Puru kenam: in Kelantan "kenam" is said to occur when small children get lumps ("kenam") all over their body. It appears as circular red spots, and it is interesting to note that it is sometimes known as "puru Burma."

Puru parang is said to complicate other sores, and to be recognised by its deep ulceration. It occurs on the foot, and is said to attack old people.

There are various other unimportant so-called varieties.

Intercurrent diseases are generally the cause of death. A first attack of puru in old age is always serious. Young children may succumb, although rarely, to asthenia. Cellular abscesses may form. Scars are indefinite, but it is exceptional to find villagers who have not had puru early in life, and who cannot point in later life to some dark scar left by the disease. The old scar of "puru ibu" is well remembered by Malays, as are vaccination marks by Europeans. It resembles in appearance the scar of scalds or burns of the third or perhaps fourth degree, except that it is dark in colour. Scars are sometimes definitely depressed, and when on the face may cause contractions of the mouth known in Malay as "sipit mulut" ("sipit," puckered; "mulut," mouth). Permanent deformity of the limbs and ankylosis of joints may also be the result of puru. This disfigurement is very common, and is known as "birat" in Malay.

The Diagnosis of Puru.

Doubtless if the nature of puru were not well understood many cases of it might be classified as syphilis, because at first sight there seem to be many points of resemblance. Both rank among affections the study of which is mainly clinical; both are constitutional diseases with a period of incubation, efflorescence and decline; each is conveyed by direct inoculation, and followed in a slowly running course by the occurrence of remainders, and perhaps sequels with a tendency towards spontaneous cure. Puru is so well known to

[1] We have to apologise to Dr. Gimlette, inasmuch as we were in error announcing his valuable communication as a Craggs' Research prize essay.—Ed. J. T. M.

Malays, however, that they are unlikely to confound it with any other disease. They know that syphilis can be passed on from father or mother to their children, but hold that puru is always acquired.

The diagnosis is chiefly based on the combination of the characteristic eruption with itching, on the peculiar insensibility of the tubercles, on the general uniformity of their aspect, and on the limitation of

FIG. 1.—Mehpih—Case 1—showing the puru ibu.

the constitutional disturbance. There is only one disease—called "supia" in Kelantanese Malay, and "sang kai she toy" in Chinese—which might be mistaken for puru. This is confined to children, and occurs about the head, neck, and scalp. It appears to be similar to impetigo contagiosa, and, except for the clinical appearance of the honey-coloured scabs, to have but little real resemblance to puru. Puru does not attack the fœtus. Even when it occurs in infants before the age of eight months, it hardly ever causes an increasing cachexia with terminal diarrhœa. The peculiar hue, physiognomy and "snuffles" of syphilitic infants are wanting. The puru ibu, again, differs essentially from the primary sore of syphilis, in being generally made up of a collection of multiple tubercles which is not prone to ulcerate, but likely to last throughout the disease. This is in marked contrast to the single sloughing sore of primary syphilis as it is generally seen in Malaya. I have never seen inflammatory sore throat ("sakit kailan" or "kekail" in Malay) in puru. Polymorphism and symmetry never strike the every-day observer in any of the skin lesions of any of the varieties of puru as they may do in syphilis. Itching is the rule and alopecia the exception. Bone lesions are, I think, rare. It is difficult, indeed, to know to which stage of syphilis the Malay puru may be compared to in detail. Although, as in Case 3, a child can infect its mother with puru if unprotected, people who have had puru can contract syphilis, and others (as in Case 4) who have had syphilis can contract puru.

European practitioners must, I think, be familiar with examples of syphilis acquired by Englishmen returning home from the Malay peninsula. Puru, however, is probably unknown to them. In the one case the disease, if acquired from a Malay, is probably due to some chance infection. In the other, a European, unless converted to Mohammedanism, could never, I think, live in sufficiently close contact with Malays so as to acquire the disease for a certainty.

CLINICAL CASES OF PURU.

CASE 1. *Puru in a Malay Child.* — Mehpih, a girl, aged about 9, Kelantan villager, born at Duson Nyor in the interior of Kelantan.

Father and mother dead; no brothers or sisters. Patient was first seen at Dusun Nyor (lit. the garden of coco-nuts) on June 13th, 1905; she is said to have been ill with puru mata kerbau for more than six months. The sores are almost confined to the legs and the back and inner side of the thighs. For the most part they are soft, yellowish-white, and moist. The secretion from all the moist sores (about five or six in number) was found to be alkaline. Some of them were inclined to bleed on being scraped. The child is anæmic, bnt otherwise the general health appears to be unimpaired. She has lost the sight of the right eye owing to an accident. There is no apparent enlargement of the spleen on palpation, although malaria is very common among Kelantan children.

Puru is very prevalent in this village. Out of about forty inhabitants, fourteen or fifteen children are ill with puru mata kerbau. Examination of blood smears taken from some of them, as well as from the patient (in the forenoon), proved to be negative.

Several smear preparations made from the sores on June 13th, and again on the 21st, were stained by the Romanowsky and other methods, but nothing distinctive was found by me under the microscope beyond a number of round granular cells which stained readily with basic dyes. There were no large cells and micrococcus-like bodies which have recently been described by Surgeon-Captain James [10], Dr. Homer

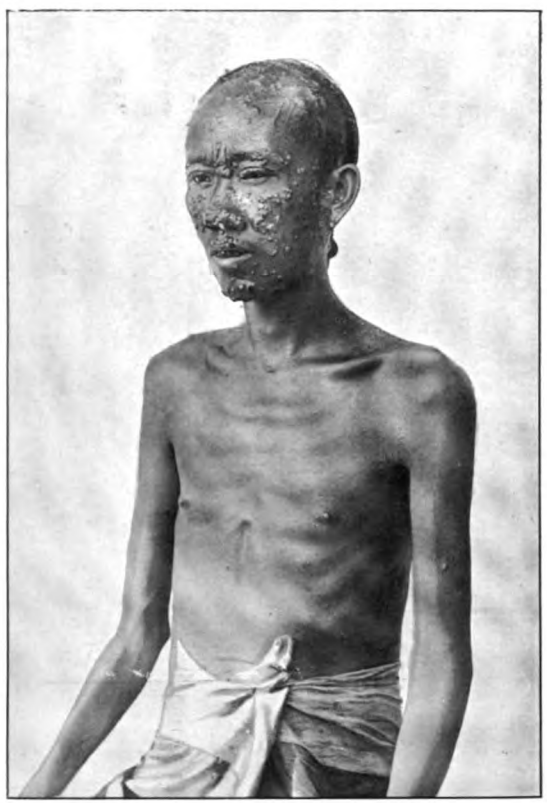


FIG. 4.—To illustrate Case 2, showing the sores of puru.

FIG. 5.—A group of Malays at Dusun Nyor, in Kelantan, showing the prevalence of puru among the children of the village.

To illustrate article by T. D. GIMLETTE, M.D., "The Puru of the Malay Peninsula."

Bale & Danielsson, Ltd., London.

Wright [17], and others, as occurring in tropical ulcer or Delhi sore. This child was treated by the local application of zinc and mercurial ointments mixed together, and when last seen on July 24th, 1905, the sores, with the exception of the puru ibu, had nearly all healed.

Case 2. *Puru in a Chinese.*—Hap Hoy, a mining coolie, native place Hong Kong, married, no children, was admitted into the Duff Development Company's Native Hospital at Kuala Lebir, Kelantan, on April 1st, 1905.

Family History.—Father died of some chest complaint about 50; mother alive and well; no brothers; one sister in good health. Has never seen any cases like his own among friends or relatives in China.

Previous History.—Emigrated from China eleven years ago, and, with the exception of malarial fever, has always been in good health.

Stayed in Singapore for five years, was in Pahang for two years, and at Tomoh for four years, when he got ill and went from there to Kelantan. He never had syphilis nor gonorrhœa; has not had sexual connection for more than twenty months; has never had a sore on the penis before. Is accustomed to take a little samshu (Chinese spirit), also chandu (opium prepared for the pipe).

States that he knows two fellow-countrymen at Tomoh who have the same disease all over their bodies, and that it is very common among the Malay children of that state. Did not live in the same house with the other Chinamen. Has eaten "budu" (a Malay condiment made of decomposing fish) when there was no better sauce to be procured.

Present Illness.—About six months ago was cutting firewood in the jungle and scratched the foot at the right ankle. A week previous had felt unwell and feverish. The ankle was painful; the scratch itched a little and presently became sore. Four or five sores then developed, and in about forty days they coalesced and reached their present horseshoe shape and size, which is (April 5th, 1905) 6·35 cm. by from 2·54 cm. to 0·63 cm. Later on the foot was painful on walking any distance. A month afterwards again felt feverish, and the eruption came out on the forehead and scalp. A sore came next on the left side of the prepuce; it itched and he scratched it. In two months' time sores had formed on the right side of the prepuce. Up till now he had continued at work, but then the sores attacked the nose and eyelids. The nasal sores spread out gradually at the nostrils until they reached their present size, namely, on April 5th, 1905, nearly 10·16 cm. by 1·9 cm. Had then to stop work as a mining coolie on account of pain in the bones and in the joints, and decided to come to Kuala Lebir. The sores are now (April 5th, 1905) drying up. No fresh ones have appeared for about a month. The last to appear were on the back.

On Examination.—The eruption is known in Malay as puru, and it has the characteristics of the disease as shown in fig. 4, which was taken on April 3rd and 5th, 1905. There is no apparent enlargement of liver or spleen. There is sympathetic femoral bubo in the right groin, but it is unlikely to suppurate. No other glandular enlargements. The foot sore is suppurating under a thick scab. The discharge is acid to litmus paper, but that from the sores on the penis and forehead is alkaline. Two tubercles were removed from the back under cocaine, as well as one from the prepuce. Prior to examination, these nodules were placed for twenty-four hours in 30 per cent. alcohol (in filtered water), then for the same time in 70 and 90 per cent., and finally in absolute alcohol. The result of the microscopical examination is given under the heading of pathology.

The sores were dressed with Scott's dressing and a mixture of iodide of potash, 5 grains, three times a day, administered by the mouth. The sore on the ankle was dressed with chlorinated soda lotion.

By the end of the month a great improvement in the general health had taken place. The pains in the limbs and joints had entirely ceased. On May 25th another tubercle was removed from the hairy part of the chin, and carbolic acid, pure, was applied to the cut surface, because it seemed as if puru sores were forming at the site of the former incisions. They all healed naturally, however, in the end. In June, the iodide was increased in dose to 10 grains and 5 minims of liq. arsenicalis were added to the mixture. The patient improved daily, but only up to a certain point. He was next given mercury internally, the liq. hydrarg. perchloridi, in half-drachm doses for two weeks, but as he appeared to be still losing ground under this treatment it was discontinued, especially as some of the old eruption (which had apparently been cured) began to recur. Various local applications were then tried, including the application of tincture of iodine, ichthyol vasogen, thymol ointment, and white precipitate ointment, but without much success. He was finally treated with zinc and mercury ointment alone, and appeared to derive most benefit from it.

(*To be continued.*)

"Archiv. f. Protistenkunde," T. vii., pp. 1-74, with 162 figures in text.

On Alternation of Generations and Change of Host in Trypanoplasma Borelli (Laveran and Mesnil).

Keyoselitz, Gustav. This is a long and very complete memoir, covering much the same ground as has been described by Brumpt, though the author differs from the latter in many points, notably in regarding the species found in a variety of freshwater fishes as all referable to the above species, the intermediate host being the leech, *Pisciola geometra*. Both the fish and the leeches often succumb to the infection, the most striking symptom in the fish being anæmia, while the colour of the leeches alter and their clitellar region becomes swollen.

He never once succeeded in infecting one fish from another even of the same species, and believes that the supposed successes of other authors were really cases of relapse of an old natural infection, and, though he was equally unsuccessful in his attempts to infect fish through the agency of the leeches, he describes in great detail a cycle of evolution which closely follows that described by Schaudinn in the case of *Trypanosoma noctuæ*, so that under natural conditions it is probable that this leech acts as a true intermediate host, and forms the agent of infection. For fuller abstracts of this paper *vide* F. Mensil in the *Bulletin de L'Institut Pasteur*, April 15th, 1906.

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THE

Journal of Tropical Medicine

JUNE 1, 1906.

PROFESSOR ELIE METCHNIKOFF.

(The Harben Lectures.)

THE Royal Institute of Public Health has from time to time brought distinguished men from several parts of Europe to London to deliver the Harben Lectures. The course for this year has been given by Professor Metchnikoff, of the Pasteur Institute, Paris, and it is scarcely necessary to add that a great scientific treat has been afforded us. The subjects chosen for the three lectures were, on May 25th, "The Hygiene of the Tissues of the Organism," on May 28th, "The Hygiene of the Intestinal Tract," and on May 30th, "Syphilis."

In the lecture on "The Hygiene of the Tissues," Professor Metchnikoff expounded his views in a condensed form, and defended the service the phagocytes render in procuring immunity, a service which is being largely claimed for a soluble substance circulating in the blood and met with in other body liquids—the opsonin of Wright.

This advocacy of a humoral action is based on the belief that microbes in the blood must be impregnated with opsonin before the phagocytes can attack them and destroy them. The *rôle* the phagocyte plays in the destruction of pathogenic microbes, if this belief be true, is only of a passive character, and dependent on the preliminary action of the opsonin. Metchnikoff is not inclined to acknowledge the superior potency of opsonin in comparison with the phagocyte in procuring immunity. He states that there can be no doubt that, under artificial conditions, and outside the body when the phagocytes are weakened they do not show their functional activity to such advantage as inside the body; but left to themselves in a liquid deprived of all opsonic substances, the phagocytes surround the microbes, only instead of doing this in a quarter of an hour, it takes them perhaps an hour or two to accomplish the act.

That the living body remains apparently healthy in spite of its containing pathogenic microbes would appear now to be a fact. A man may be the host of diphtheria bacilli, cholera vibriones, the *Bacillus typhosus*, and other bacteria, without necessarily developing the corresponding diseases. It is even possible to introduce tetanus spores into an animal so peculiarly sensitive to tetanus as the guinea-pig without the animal acquiring the disease. When, however, the guinea-pig so infected is placed under unfavourable conditions, as by exposing it to a very high temperature, the resistance of the animal is overcome and the disease asserts itself.

Human beings may serve as bacilli carriers without they themselves being the subject of the disease which the bacilli may give rise to in others; this fact is of superlative interest and importance in the study of epidemiology, and is one calculated to divert our attention to other sources of infection than to those we are accustomed to view with suspicion, such as milk, water, and other articles of food and drink.

Metchnikoff sums up his conclusions on this subject by stating that all observations on immunity against infective agents points to the belief that this phenomenon is the result of phagocytic action, or, in other words, that immunity is a function of the cells. Of substances which hinder phagocytic action, opium and alcohol are perhaps the chief, but he also inculpates quinine as a poison to the white blood cells. Increased resistance towards pathogenic microbes is a department of prophylaxis which promises to play an important part. Issaeff, some ten years ago, showed that increased resistance could be procured in guinea-pigs by injecting these animals with such liquids as normal saline solution, urine, and serum. R. Petit has recently employed heated horse serum in his gravest operations. In a case of abdominal section on a woman, on whom he operated for multiple fibromata of the uterus, complicated by inflammation of both adnexa and by suppurative pelvic peritonitis, Petit poured into the abdominal cavity before suturing the abdomen about 30 grammes of heated horse serum with successful results. Several other surgeons have followed Petit's example, and in cases of abdominal and pleural operations the use of heated horse serum has been eminently satisfactory. Miculiez, by introducing subcutaneously injections of a solution of nucleinic acid twelve hours before operation, showed that an increase in the number of white blood corpuscles in the blood occurred, reaching, in one instance, to as many as 24,000 per cubic millimetre.

Whether it be heated horse serum, a nucleinic acid, or other substances that are employed, Metchnikoff considers that they all act in one way. The influence they exert is not brought about by an increase in the sensitising substances nor by a production of opsonins, but by enhancing the phagocytic reaction.

By the establishment of the thesis that the phagocytes are our arms of defence against the infective germs which beset our bodies, Metchnikoff contends that the first step forward in the hygiene of the tissues has been made, and that a secure foundation stone has been laid on which to build our knowledge and experience.

MALARIA IN CUBA AND PANAMA.

W. C. Gorgas, M.D., Chief Sanitary Officer, Canal Zone, Panama, stated at the annual meeting of the American Society of Tropical Medicine on March 24th, 1906, that while the percentage of fatalities is not nearly so great as from some other tropical diseases, the amount of incapacity caused by malaria is very much greater than that due to all other diseases combined. He drew attention to the deleterious effect of unchecked malaria upon soldiers during a campaign.

The effect of the eradication of mosquitoes, upon the number of cases of malaria was very noticeable in Havana. For many years the average number of deaths from malaria amounted in Havana to 350; in 1901, the first year of the anti-mosquito campaign, the number of deaths from malaria amounted to 151 only; in 1902 there were 77 deaths from the disease; in 1903 about 50, and during subsequent years it averaged about 40. In the hospital at Ancon, Panama, in the six months ended March, 1906, Colonel Gorgas had personally treated 1,055 cases of malaria with only five deaths. The Æstivo-autumnal variety predominated, and quinine was the invariable mode of treatment. Of twenty cases of hæmoglobinuric fever in the eight months ended March, 1906, only three died.

THE PLAGUE.

Prevalence of the Disease.

		Cases.	Deaths.
India.—Week ended	March 10th	10,665	9,058
,,	,, 17th	13,325	10,722
,,	,, 24th	17,240	15,464
,,	,, 31st	13,996	11,823
,,	April 7th	23,055	19,727
,,	,, 14th	20,478	17,673
,,	,, 21st	19,674	17,679
,,	,, 28th	17,885	15,633
,,	May 5th	15,892	13,295
Hong Kong.—Week ended	Mar. 31st	27	25
,,	April 7th	24	22
,,	,, 14th	21	23
,,	,, 21st	24	27
,,	,, 28th	58	52
,,	May 5th	61	58
,,	,, 12th	96	89
,,	,, 19th	90	83
,,	,, 26th	116	116

Persia.—Plague continues in epidemic form in Eastern Persia (May 29th).

Arabia.—Plague has been declared at Jiddah (May 30th).

Egypt.—During the week ended April 15th, 35 cases of plague were recorded in Egypt, chiefly in the Minieh and Keneh provinces.

Reviews.

The Nature and Treatment of Cancer: Some Methods of Hypodermic Medication in the Treatment of Inoperable Cancer. By John A. Shaw-Mackenzie, M.D.Lond. Third edition, revised and enlarged. London: Baillière, Tindall and Cox, Henrietta Street, Covent Garden, 1906. Pp. 99. Price, 2s. 6d. net.

Every practitioner will welcome this concise account of the treatment of cancer by modern methods. The principal remedies dealt with are Chian turpentine, soap and ox-gall, and trypsin. The results given are, to say to the least of them, encouraging.

The Animal Parasites of Man. A Handbook for Students and Medical Men. By Dr. Max Braun. Third, enlarged and improved edition, with 294 illustrations in the text. Translated from the German by Pauline Falcke. Brought up to date by Louis W. Sambon, M.D., Naples, and Fred V. Theobald, M.A. London: John Bale, Sons and Danielsson, Ltd., Great Titchfield Street, Oxford Street, W., 1906. Price, 21s. net.

Parasitology is assuming so important and prevailing a position in medicine that for several years to come it will be assigned the foremost place amongst the several accessory departments of scientific research and study. It is essential, therefore, that an authoritative text-book should be in the hands of medical men.

Dr. Max Braun's well-known work on the "Animal Parasites of Man" has, it is to be feared, been capable of being read by only a very few practitioners owing to lack of knowledge of German, and we are thankful to the translator and to the publishers, who, at a great sacrifice of time and of money, have now given us an English edition of this important work.

Braun's work is the best book on the subject, and it has been translated by Miss Falcke, on whom we, in this country, have come to largely rely for accurate translation of German medical and scientific books into English.

The chapter on parasites in general is a liberal education in itself, and were the student of general medicine to advance no further than this chapter in his reading he would be placed in a position to grasp the importance of the subject, and to lay a foundation on which to base a scientific knowledge, so as to enable

him to enquire more carefully into any branch of the subject he may be interested in.

The protozoal, the primitive, parasites, are in many ways, perhaps, the most interesting; chiefly on the ground that they are of all parasites the most closely studied at the present time. Amongst the protozoa we find the rhizopoda, of which the various amœba are best known; the flagellata, represented by trichomonas, cercomonas and trypanosoma; the sporozoa, of which the gregarinida and the large group coccidiida are of high importance, and yet better known the *Plasmodium malariæ* of Laveran. The flat-worms (platyhelminthes) and the thread-worms (nematodes) are more familiar to the general reader, and the student of tropical medicine will take special interest in the filaria and the ankylostoma. Of the various groups of arthropoda, the arachnoidea, from the fact that the several species of argas and of ornithodorus are included amongst them, are of special interest at the moment. A separate chapter is devoted to mosquitoes and the various flies, including the tsetse-flies.

The illustrations are clearly represented and their accuracy incontestable. The study of parasitology is yet in its infancy, but before its literature becomes too voluminous it would be well for present-day students to master the contents of this book so that the subject may be readily understood and followed. We are indebted to Dr. Sambon for his careful revision of the chapters on protozoa, cestodes, and nematodes; and to Mr. Theobald for his exposition on the trematodes, arthropoda and several other sections of the work. We congratulate the publishers upon the general appearance of the book and for supplying us with a clearly printed text.

The thanks of the profession are due to the publishers, the translator, and to Dr. Sambon and Mr. Theobald, for placing within our reach an authoritative text-book on an important subject.

Drugs and Remedies.

HELMITOL, a powerful urinary antiseptic, is a preparation of the Bayer Company, Limited, 19, St. Dunstan's Hill, London, E.C. In the treatment of cystitis, fœtid urine, and in troubles associated with enlarged prostate, it is excellent. In gonorrhœa helmitol internally, combined with local injections of protargal, is efficient.

SOLUROL (thyminic acid) in 3 or 4 grain doses daily after meals is a new remedy for gout, introduced by Allen and Hanbury, Limited, 37, Lombard Street, London, E.C.

Notes and News.

AN "At Home" at the Royal Albert Dock Branch of the Seamen's Hospital Society, on Saturday, May 19th, was attended by about 200 executive officers of all the London and many provincial hospitals. The occasion was the completion by Mr. P. Michelli, Secretary of the Seamen's Hospital Society, of his year of office as President of the Hospital Officers' Association, and amongst those present were Sir Francis Lovell, Sir Frederick Young, Capt. Tunnard, Mr. Keith D. Young, the Society's architect; Mr. W. R. Pite, architect to the new King's College Hospital; Dr. Harford, of Livingstone College; Dr. C. C. Choyce, Medical Superintendent of the Dreadnought Hospital; Capt. Worlidge; Mr. Walter Alvey, Honorary Secretary Hospital Officers' Association; and Mr. Charles T. Walrond, consulting engineer St. George's Hospital and the Children's Hospital, Great Ormond Street, and several others. The Hospital and the London School of Tropical Medicine in connection therewith were open to inspection, details of the building being given by Mr. Keith D. Young. A lantern demonstration was given in the theatre of the School and a demonstration of microscopic specimens of the parasites of malaria, sleeping sickness, &c., was given by Dr. Stanton in the laboratories. Speeches were delivered by Sir Frederick Young and others, and opportunities were afforded for visiting vessels of the P. and O. and Ocean Lines.

SPREAD OF LEPROSY BY INSECTS.—Dr. W. T. Goodhue, Superintendent of the Molokai Leper Settlement, states that he has found the *Bacillus leprœ* in the female mosquito—*Culex pungens*—and in the bed-bug—*Cimex lectularius*. The fact that the leprous bacillus has been found in insects is not, we believe, new; what we are anxious to know is whether these insects play a part as intermediate hosts, and what cycle of evolution, if any, takes place in their economy.

W. C. GORGAS, Chief Sanitary Officer, Isthmian Canal Commission, Panama Canal Zone, in a report dated Ancon, April 16th, 1906, states: The health conditions continue excellent. No quarantinable disease occurred in the Zone during March. No case of small-pox has occurred within the last year. The last case of plague occurred seven months ago, and the last case of yellow fever over three months ago. Among the 25,000 employees we had 78 deaths, 10 among the whites and 68 among the negroes. Of the 10 whites 5 were from the United States. Of these 5 only 3 died from disease, 1 from pneumonia, and 2 from dysentery. The two principal causes of death among the employees were malaria, 22, and pneumonia, 17. The disease that caused the next highest death-rate was dysentery, 8, and the next after that accidental traumatism, 4. The March in which the French had the largest number of employees on the Isthmus was the March of 1885, when they had 16,755 men on their rolls. During that month they had 9 deaths from yellow fever in Ancon Hospital. How many deaths occurred outside of that hospital they had no means of finding out. During March of 1906, with our force of 25,000 men, which is the largest we have had, we had not a single case of yellow fever on the whole isthmus. But the best measure of the health of a body of men is the average number daily

sick. We had in our hospitals from our 25,000 employees, on each day for the month of March, an average of 491 sick men, which would give us a rate of 19·65 per 1,000, an exceedingly good showing.

COLONIAL NURSES DECORATED. — Mrs. Duncan Urquhart and Miss Margaret Graham have been decorated by the Order of St. John of Jerusalem in England. Their names were brought to the notice of Mr. Chamberlain, then Colonial Secretary, by the Principal Medical Officer of Southern Nigeria, for the excellent work they did during the recent expeditions and for the devotion and self-sacrifice shown by them on all occasions. Mrs. Urquhart and Miss Graham have been admitted honorary nursing sisters and are entitled to wear the Maltese Cross of white enamel of the Order of St. John.

MOSQUITOES.—*Culex solicitans* will breed in no other place than salt water. To get rid of this mosquito it is necessary to drain the salt-water swamp lands along the coast where this mosquito prevails.

TRACHOMA IN MONTREAL.—Amongst 1,000 emigrants from Europe, one half of which were composed of Russian Jews and Syrians, 150 cases of trachoma were found.

Personal Notes.

COLONIAL MEDICAL SERVICE.

Dr. Derwent Waldron, Senior Medical Officer, Gold Coast Colony, has arrived in England on leave of absence.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Transvaal Medical Journal," March, 1906.

Maynard, G. D. "Some Observations on the Protozoal Diseases of the Blood, with Special Reference to the *Piroplasma Bigeminum*."

Of forty-five cows inoculated with the blood from a heifer which had recovered from an experimental attack of red-water disease, 4·4 per cent. died. Of forty-three cows in the same herd which were allowed to contract the disease naturally, 11·7 per cent. died. The cows showed a reaction (first) on the tenth day, and also a reaction (second) on the twenty-fifth day after experimental reaction. In regard to the appearance of *Piroplasma bigeminum* in the red corpuscles, Maynard is of opinion that when two parasites appear in a cell the explanation is to be frequently found, not in the division of an originally single parasite, but in a double infection by two young parasites. The two parasites may be gametes about to conjugate to form a zygote, so that a sexual cycle, as well as an asexual cycle, might be assumed to occur in the one host. A prolonged observation, however, failed to demonstrate any union of pairs, but on the other hand, the mother parasite extruded from its substance a small mass of protoplasm which grew in size, and finally became free from the parasite and the red corpuscle in which the parent was contained. In addition to the extrusion of these daughter cells the parent parasite also undergoes several divisions within the red corpuscles before the daughter cells are extruded. The frequent appearance of two chromatin masses in the pear-shaped parasite seems to suggest a nuclear division prior to conjugation. The possibility, therefore, of a sexual as well as an asexual cycle in piroplasma infection would seem a feasible interpretation of the phenomena observed, and of the clinical symptoms and behaviour of this disease generally. From the fact that conjugation in certain forms of the tertian malaria parasite has been stated to occur, Maynard suggests that the peculiarities of malignant malaria seem to demand some such interpretation not accounted for by the theories explaining the symptoms of simple malaria.

"Journal of the American Medical Association," March 24, 1906.

Vedder, E. B. "An Examination of the Stools of 100 Healthy Individuals, with Special Reference to the Presence of *Entamœba Coli*."

The *Amœba coli* has been found by Schaudinn, Craig and others in from 20 to 65 per cent. of the stools of healthy individuals in different parts of Europe. Vedder, from observations made in the Philippines, recently found that of Americans in the Philippines 50 per cent., and 70 per cent. of the natives of the Philippines harboured the parasite. As these were healthy persons the observation helps to confirm the belief that the *Amœba coli* is not a pathogenic factor in the production of dysentery.

Vedder classifies the characteristics of the dysenteric and of the normal amœbæ as follows:—

Entamœba Dysenteriæ.	*Entamœba Coli.*
SIZE.	
25-30 microns.	(Not a distinguishing feature.) 10-20 microns.
SHAPE.	
Usually some other shape.	Spherical when resting.
COLOUR.	
Greenish.	Opaque greyish.
PROTOPLASM.	
Ectoplasm and entoplasm *easily distinguished.*	Ectoplasm and entoplasm *distinguished with difficulty.*
Ectoplasm very refractive.	*Ectoplasm not refractive.*
Ectoplasm finely granular.	Entoplasm homogeneous.
Entoplasm coarsely granular.	Entoplasm finely granular.
PSEUDOPODIA.	
Large and easily distinguished. Certain ectoplasm and entoplasm.	Entirely ectoplasm. Hard to distinguish.
VACUOLES.	
Many vacuoles.	Vacuole absent usually. Never more than one.
NUCLEUS.	
Often absent. When present structure of nucleus hidden except in stained specimens. Nuclear membrane not well defined.	Almost invariable, with well-defined nuclear membrane and other structure.
Changes position markedly.	In moving organism retains its relative position.
RED CORPUSCLES INGESTED.	
Many.	None observed.
MOTILITY.	
Great progressive motility.	Often absent, and when present, of limited extent and short duration.

"Il Policlinico," Rome, May, 1906.

THE CEREBRO-SPINAL FLUID IN CERTAIN CASES OF PERNICIOUS FORMS OF MALARIA.

"Il liquido cefalo-rachidiano in alcuni casi di perniciosa malarica." By Dr. Nicola Pende.

According to Dr. Pende the study of the cerebro-spinal fluid in malarial infection has been entirely overlooked, which is the more remarkable as the examination of this

liquid is now undertaken in nearly all morbid processes complicated by severe nervous symptoms, from which list malarial infection cannot well be excluded.

Two indications are now specially sought for in the study of the cerebro-spinal fluid. The one is essentially a clinical one, or an aid to diagnosis; the other is essentially a scientific one, relating to the physio-pathology of the cerebro-spinal fluid, in the hope of finding therein a key to the mechanism of the symptoms due to the neural axis. With this double object in view, Dr. Pende undertook some researches on the cerebro-spinal fluid in malarial cases, restricting himself for the present to the more severe forms of the disease, *i.e.*, the pernicious forms. The severity and diffusion of the æstivo-autumnal attacks which were recently noted in the Roman hospitals supplied him with many cases for observation; nevertheless, in many instances, he experienced some considerable difficulty in obtaining the fluid, either because the pernicious condition of the patient was a contraindication for the lumbar puncture, or because the quantity so obtained was insufficient, or was not perfectly clear owing to the admixture of blood. For these reasons the present remarks apply only to five cases of pernicious attacks of malaria, specially selected for their nervous symptoms.

Each examination of the cerebro-spinal fluid included not only the cito-diagnostic formula, but also, as far as possible, the principal physico-chemical properties. A bacteriological examination was unnecessary owing to our certain knowledge of the etiology of malaria; in each instance the following were specially sought for:—

(1) The state of compression of the fluid.
(2) Appearance and chromo-diagnosis.
(3) Density.
(4) Crioscopic point.
(5) Hæmolytic power.
(6) Amount of albuminoids.
(7) Fibrinous reticulum.
(8) Amount of chlorides.
(9) Sediment, especially with regard to the cito-diagnostic formula.

The fluid extracted never exceeded 20 cc. The cases occurred in women of all ages, who were received between June and December, 1905, into the Hospital of St. John Lateran. A series of control experiments, conducted on the identical lines, were carried out in perfectly normal cases who had been admitted to the surgical division of the same hospital.

For the study of the compression of the cerebro-spinal fluid a special form of manometer was used. The crioscopic point was determined by Beckmann's apparatus; Bard's process was employed for studying the hæmolytic power; the amount of chlorides was obtained by the Wolhard-Salkowski method; lastly, for the cito-diagnostic examination, Nikiforoff's reagent was employed for fixing the slides, which were then coloured with thionin or with hæmatoxylin and eosin.

The results obtained from the examination of the cerebro-spinal fluid of healthy women was as follows:—

The pressure varied enormously; the density was 1007 to 1010; the congesting point = 0·65; albumen, constantly present; percentage of chlorides, 0·8 per cent.

Some clinical notes on the several cases of pernicious attacks now follow, but want of space prevents their insertion here.

* * * * *

As a result of these observations, Dr. Pende states that the cerebro-spinal fluid may present, in certain cases of pernicious malarial attacks, alterations both in its physico-chemical properties and in its cito-diagnostic formula.

One constant feature was noted in all the cases, viz., a more or less diminution of osmotic tension. It is important to note that the hypotonic condition of the cerebro-spinal fluid has, until now, been considered almost pathognomonic of meningitis, whether tubercular or cerebro-spinal, but as has been seen, this same hypotone may be found also in the severe nervous forms of malarial infection.

In two of the cases lymphocytosis was superadded. Thus malaria in its severe forms has to be added to the somewhat lengthy list of morbid processes, accompanied by lymphocytosis of the cerebro-spinal fluid.

The percentage of chlorides in the majority of cases was diminished.

As regards the chromo-diagnosis, in one case the liquid was yellowish, and in another it showed a bright green fluorescence.

Dr. Pende considers the serious disturbances which the cerebral circulation undergoes, owing to the heaping-up of the parasite-infected corpuscles in the capillaries, as sufficient to explain the origin of the above-mentioned modifications. The alterations of the endothelium of the capillaries and the obstruction of many of these by parasitiferous thrombi may be the cause of some of the blood elements passing from the capillaries themselves into the perivascular lymphatic spaces, and from these into the arachnoid cavity, which elements may produce the diminution of the molecular concentration of the cerebro-spinal fluid, or the presence of blood corpuscles, or lymphocytosis, or yet again, the presence of pigment, and perhaps also of toxic substances already existing in the circulating blood.

As to the question whether the alterations of the fluid can enter into the pathogenic mechanism of the nervous symptoms of pernicious fevers, little as yet can be said definitely, for the physio-pathology of the cerebro-spinal fluid has not yet furnished us with sufficient experimental or clinical data to solve this problem. J.E.N.

"Centralb.. f. Bakter.," 1, Origin., T. xl., p. 290.

RESEARCHES ON BACILLARY DYSENTERY.

Ludke, H. The author has studied the agglutinins and precipitins of the bacillus of dysentery. Their behaviour, when treated with strongly agglutinating serums of the Shiga-Kruse and Flexner bacilli respectively, leads the author to believe that the latter is a variety of dysenteric bacillus which appears only in certain epidemics.

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Original Communications.

SUBHEPATIC ABSCESS.

By James Cantlie, M.B., F.R.C.S.

The classification of abscesses of the liver, which for the past ten years I have adopted as a means of clinical differentiation, would appear to hold good as experience extends. The terms suprahepatic, intrahepatic, and sub- (or infra) hepatic abscesses have more than a mere anatomical or descriptive convenience and significance, more even than a clinical import, for investigation has served to establish a pathological basis of some reliability.

The examples of subhepatic abscess which have come under my notice have been few, five in all, four of which occurred in patients of my own. By a subhepatic abscess I do not merely mean that pus from the liver has simply pushed its way downwards to the under-surface of the liver, and there opened into a neighbouring organ or into the peritoneal cavity, but that the abscess originated on the under-surface of the liver, between the peritoneum and the liver substance, and involved the neighbouring liver tissue secondarily.

In three of the five cases of subhepatic abscess, the pus drawn off at the operation was proved to be sterile. This is in no way characteristic or exceptional, for in 32 out of 47 suprahepatic abscesses I have operated upon the pus has also been found to be sterile. On the other hand, the abscesses originating intrahepatically have almost, without exception, been proved to contain bacteria in the pus drawn off when the abscess is first opened. I do not refer to the amœba, which we meet with in the wall of every collection of liver pus, as it is in the wall of most abscesses connected with the abdomen, and is therefore without specific pathological significance.

A subhepatic abscess may occur in persons who dwell in the Tropics or who have never been out of Britain. Of the cases in question the habitat of the patients was as follows:—

No. 1, an American sailing ship captain, who, whilst his ship was lying in Hong Kong harbour, developed a subhepatic abscess. No 2, a lady who had resided some years in Alexandria. No. 3 a man who had never left Britain. No. 4, a sailor who belonged to the Royal Navy. No. 5, a man who had never left Britain. Subhepatic abscess has no pathological relationship with dysentery or any form of intestinal flux, although in two of the cases the patients confessed to diarrhœa but not to dysentery.

In four of the cases the collection of pus was on the under-surface of the right half of the liver, to the right of the gall-bladder; in the fifth case the under-surface of the left half was involved.

History of a Typical Case of Subhepatic Abscess.—The patient becomes conscious of a discomfort in the neighbourhood of the right rib cartilages, intermittent at first but in time becoming more persistent; the discomfort is most marked during the day, and lying down affords relief. As a rule the pain is referred to the neighbourhood of the gall-bladder, and at first, and indeed later, the signs and symptoms appear to indicate gall-stones, or an inflammatory affection of the gall-bladder. Occasional attacks of fever, passing off in sweats, occur, and if the patient has been in a subtropical or tropical country, malaria may be (and has been) suspected to be the cause. The indefinite nature of the ailment leads to delay in diagnosis and to the necessary treatment; for a tender spot with some fulness beneath the right rib cartilages may be ascribed to kidney, liver, gall-bladder, pancreas, or bowel. The mobility of the swelling points to the possibility of a movable kidney; the general disturbance with pain in the region of the liver suggests hepatitis or perihepatitis or hepatic abscess; the situation and shape of the swelling, the local pain, and the fever accompanying the condition, would seem to definitely point to a cholecystitis; but malaria, malignant disease of the hepatic flexure of the colon, pancreatic cyst and hydatid, have each and all been suggested as explanations of the indefinite clinical signs and symptoms which obtain when a collection of subhepatic pus occurs.

The further general signs and symptoms it is needless to recount, a collection of pus anywhere in the upper part of the abdomen will give rise to occasional vomiting, furred tongue, loss of appetite, a markedly fluctuating temperature, rigors, sweatings, disturbance of the bowels now loose now constipated, and so on. There is no one sign or symptom, when a swelling occurs in the epigastrium or right hypochondrium, that can determine the diagnosis, nor any group of signs or symptoms which may not bear in the present state of our methods of clinical diagnosis, a plethora of interpretation.

Given, however, a distinctly painful spot on the under-surface of the liver associated with constitutional disturbance and pyrexia, and, it may be, a blood examination suggesting pus, an exploratory incision ought to be made without hesitation.

Case 1.—Captain of a sailing ship, aged 42, plying between New York and Hong Kong, developed a subhepatic abscess. The captain lived on board ship, which had been lying in Hong Kong harbour from November to March before the abscess was detected. The patient was operated upon with the idea that he was suffering from cholecystitis. When the abdomen was opened a sausage-shaped swelling was found lying parallel to and 1½ inches to the right of the gall-bladder. The wall of the abscess cavity was stitched to the abdominal wall and the abscess cavity opened and drained. The abscess extended almost the whole breadth of the liver in an antero-posterior direction. The patient returned to his ship in twelve days, sailed on the thirteenth day, and only withdrew the drainage tube some six weeks later whilst on the voyage. He made a perfect recovery.

Case 2.—A lady, aged 31, married, one child, had had several attacks of "fever" and diarrhœa in Egypt. When seen in London there was a movable swelling between the right hypochondrium and the right lumbar regions; the spleen was enlarged, the liver dulness increased downwards, febrile attacks with irregular temperature and malarial parasites in the blood. I diagnosed the case as one of malaria with movable kidney. Subsequently, when the swelling was exposed, it proved to be a subhepatic abscess, identical in situation and in character with Case 1. The patient recovered.

Case 3.—A man, aged 38, resident in London for ten years, who had at one time served in the army in Malta, but have since never left the British Isles. The clinical evidence all pointed to the presence of pus in the gall-bladder, but when the abdomen was opened, an abscess reaching from the anterior to the posterior border of the liver parallel and to the right of the gall-bladder was found. The abscess was opened and drained by an opening both in front and behind near the angles of the ribs. The patient recovered.

Case 4. *The Effect of Sterile Pus in the Cavity of the Abdomen.*—A sailor, aged 35, recently in the Royal Navy, had to leave his ship with all the signs and symptoms of liver abscess. At first he refused to be operated upon, and it was not until the severity of the illness became alarming that he consented. On cutting down upon the swelling in the right hypochondrium an abscess was found on the under-surface of the liver; the wall of the abscess had attained adhesion to the peritoneum in the right lumbar region, and the pus extended as low and as far back as the upper end of the right kidney which was incorporated with the swelling. Moreover, the pus had burst into the cavity of the peritoneum. The contents of the abdomen from diaphragm to pelvis were covered over by a slimy, muco-purulent-looking fluid. There were no signs of peritonitis, no adhesions, no flocculent pus, nothing except this passive effusion of slimy, muco-purulent-looking fluid in great quantity. The pus from the abscess cavity and the semi-fluid material from the surface of the peritoneum were examined bacteriologicaliy, and both were pronounced sterile. This is, so far as I know, the first recorded case of the kind, and it is of special interest.

The treatment in this case consisted of free incisions in the abdomen in right and left lumbar regions, and in the middle line below the umbilicus, flushing the abdominal cavity with saline solution, and the insertion of large drainage tubes. The liver abscess was drained separately. The patient is now (June 11th, 1906) convalescent.

Case 5. — A man, aged 37, resident all his life in Britain, had signs and symptoms of abscess of the liver in 1904. The abscess was not operated upon, and the pus burst upwards through the lung. The expectoration of pus ceased, and the patient for a time was fairly well. After four months the local signs and symptoms returned, and again he went into hospital; no operation was performed, and again he seemed to recover, but without any expectoration of pus. He continued to have hepatic pain and fever at intervals until May, 1906, when I found him with increased temperature, an epigastric swelling, local pain, and general discomfort. After five days he came into hospital, by which time the swelling had disappeared, the temperature had fallen to normal, and the patient said that the day before he came into hospital he had passed at stool a large quantity of "the same material he had on a previous occasion coughed up." It was plain the abscess had burst into the bowel, the colon in all probability. So far as I can learn, this is the only instance of a hepatic abscess which has been known to burst in two directions, namely, upwards through the lung and subsequently downwards into the bowel.

When cut down upon, an abscess was found on the under-surface of the left half of the liver near the posterior border; the liver, stomach, and colon being adherent to the wall of the abscess. The treatment consisted in exposing the swelling, packing the wound, and at the end of a week opening and draining the cavity. The pus from this abscess was sterile—a peculiar and most unexpected condition, seeing that there had been a double source of possible contamination, namely, by way of the lung and by way of the bowel. The patient is still under treatment.

THE ANATOMY OF THE BITING FLIES OF THE GENERA *STOMOXYS* AND *GLOSSINA*.

By Lieut.-Colonel G. M. Giles, I.M.S. (Rtd.).

(*Continued from p.* 173.)

The œsophagus, after its commencement in the pharynx is a rather delicate tube. As seen in fig. 24, A, it is lined with an extremely delicate membrane, which is probably smooth in the fresh state, but is much wrinkled as seen in a transverse section on account of the shrinking action of the reagents employed on the softer tissues. In some of the folds thus produced there will always be found minute bodies which stain strongly with nuclear dyes and possibly are nuclear bodies. The main thickness of the walls of the tube is, however, formed of a ring of faintly granular material which shows fairly clearly a longitudinal striation, as seen in transverse section. These fibres are probably muscular. In the same sheath with these and lying always towards the lumen of the tube are some oval nuclei provided with a distinct nucleolus.

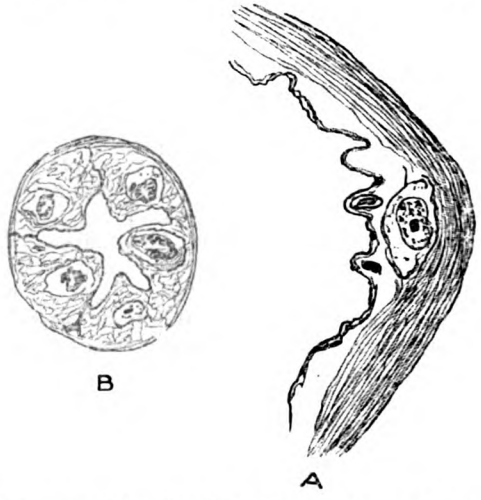


Fig. 24.—A, portion of wall of free œsophagus in transverse section: B, transverse section of the œsophagus as it passes through the nerve collar.

There are rarely more than two of these, usually almost opposite each other, in a fairly thin transverse section of the organ, and I believe them to be muscle nuclei. Outside these are some scattered cells of about the same size as these muscle nuclei, but they do not seem to be concerned in the structure of the tube, and are more probably lymph cells.

The narrow portion of the œsophagus, when it passes through the nerve collar, has a very different structure. The muscular and chitinous coats are both so thin as to be barely perceptible, and the place of the small nuclei, to be seen between the folds of the chitinous inner lining of the first part, seems to be taken by a continuous coat of large cells which have the appearance of epithelial elements. The lumen is here stellate in transverse section, and, on account of the size of the above-mentioned cells, extremely contracted.

The histology of the nerve centres does not differ from that of other diptera, a prominent character of which is the smallness of the component cells. In the layer of grey matter that surrounds the white commissural masses, two distinct forms of cells can be distinguished. In one of these, which one would be inclined to believe motor in function, the structure consists of multipolar cells, usually about the diameter of a human leucocyte. They have large nuclei, but still possess a considerable volume of protoplasm. Their prolongations give off fibres which occasionally can be traced for some distance. A good example of a ganglionic mass of this structure is to be found on the surface of the ventral nerve cord in the middle line.

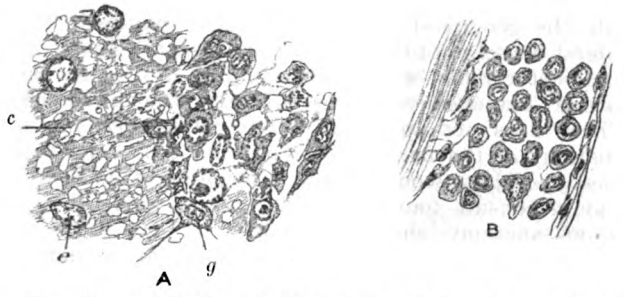


FIG. 25.—A, Portion of the ventral commissure and of the motor median ganglionic mass in that situation; *c*, commissural structure; *g*, motor ganglion cells; *e*, elements embedded among the commissural fibres. B, Cortical layer of anterior surface cerebral lobe.

The greater part of the sides of the cerebral masses is occupied by the ganglia of the compound eyes, the retinulæ of which are continuous with the cerebral mass, but this has been too frequently described to render desirable any further description here. An account, running to some 70 pages, will be found in Lowne's work already quoted, commencing p. 515.

On the anterior surface of the brain, however, between the compound eyes, is a ganglionic layer which is probably sensory in function. The component cells of this are quite different from those of the presumed motor areas, the cells being smaller (about the diameter of a human red blood corpuscle) and apparently for the most part quite without prolongations, though a few scattered cells of larger size show an irregular outline, which suggests the existence of these. There are four or five rows of these, and between them and the white matter lies a row of very small and distinctly multipolar cells. The outer surface of the brain is bounded by a membrane formed of closely adherent spindle-shaped cells, with large oval nuclei. In other places the thickness of the ganglionic masses may be as much as 20 or 30 rows of cells deep. In using the word "row" it is not implied that the cells are arranged in regular strata, as their disposition is quite irregular, but refers merely to the number of cells which may be counted in the width of a section. In specimens stained with borax carmine, a number of black pigment granules will be seen in these cells, and impart to them a very characteristic appearance, which is useful in recognising similar ganglion cells, in other situations than the brain, as, for instance, in the subcuticular tissue, beneath the sense organs of the antenna, but in staining with hæmatin and most of the aniline dyes, they cease to be distinguishable, on account of similarity of colouration with other deeply stained granules. Between the various bands of fibres of the white matter, may be found a number of ganglionic masses, composed of cells of each of the above descriptions, though the motor type predominate. Lastly, scattered between the fibres are a number of large clells or nuclei (*e*), presenting a large, clear, central area, and round their periphery a number of deeply staining granules, but these are probably not nervous structures at all, but of a trophic function.

In Mr. Austen's monograph of *Glossina*, mention is made (p. 63) of a sense organ placed near the base of the third joint of the antenna, but without any detailed description of its structure. In the corresponding position in the antenna of *Stomoxys* a similar organ is to be found, which, though I have made no examination of it in the former genus, has probably a similar structure. Judging from Lowne's figures, this organ is represented also in the blow-fly, but differs somewhat in details of structure.

In *Stomoxys* the aperture of the organ is oval and is hidden by closely set, long, flexible hairs. This slit opens into a sausage-shaped saccule, within which is a T-shaped projection which springs rather from the anterior side of the saccule, the stem being short and the top of the letter long and generally conforming to the outline of the cavity, so that it appears as an isolated piece in transverse sections that pass elsewhere than in the plane of the stem. The whole of this cavity is lined with peculiar stiff hairs, the bases of which are short and conical, while they end in a long bristle. These chitinous structures overlie a layer of ganglionic cells, from each of which a fibre runs to a hair, while proximally each ganglion cell receives a fibre from a ganglionic enlargement of the antennal nerve, which fills up the greater part of the cavity of the second antennal joint. The function of the organ is probably that of hearing. In addition to the saccule the whole surface of the organ is covered with sensory hairs, each of which has a similar nerve supply, and in the neighbourhood of the sacule are a number of peculiar sense organs of a quite different character. A number of these are to be found amongst the bases of the long soft hairs that guard the mouth of the saccule, while many others of considerably larger size are contained in a porous plate on the outer face of the antenna which is comparatively free from hairs. Though varying a good deal in size, even in the porous plate, they all have essentially the same structure, and consist of an ovoid crypt, communicating by means of a pore with the exterior, and springing from the base of which is

a club-shaped body which fills most of the interior of the crypt. From the club-shaped end of this body springs a soft conical hair, the fine termination of which projects into the pore. Two rows of very large organs of this sort are also to be found on the posterior face of the antenna. The nervous supply of these peculiar structures is exactly similar to that of the other hairs. They are believed to be olfactory organs, but in view of their graduated size it would be open to any one to suggest that they are chordotonal

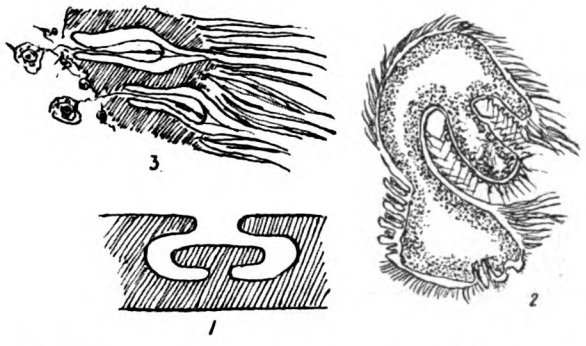


FIG. 26.—The sense organs of the antenna. (1) Diagrammatic longitudinal section; (2) transverse section, × 250 diams.; (3) vertical section of position of outer wall of antenna, × 700 diams.

organs. That certain insects lose the sense of smell, when deprived of their antennæ, has been fairly proved by Lubbock and others, but as to which of the various sense organs found on the appendage may serve this or that function must always remain a matter of pure conjecture.

The thorax in all diptera is little else than a solid mass of muscle. If we snip off with sharp scissors, the legs, with a little of the ventral wall of the thorax, the ends of a number of vertical bundles are seen cut across. These are the coxal muscles of the three pairs of legs, and if these be separated in the middle line there will be seen opposite the anterior legs a sausage-shaped mass of considerable size, the great thoracic ganglion. Clearing this away and just under its anterior end will be seen a nodule of the size of a small pin's head, and closer inspection will show that there extends backwards from it a glistening tube which is most characteristically marked with closely placed mammilations. This is the mid-gut, and lying on it will be seen three delicate tubules, the middle and most delicate of which is the crop duct and those at the sides the now glandular salivary glands. The mid-gut can be traced forwards beyond the nodule, and with sufficient care can be shown to be continuous with the œsophagus, as it escapes from the nerve collar. The nodule is placed at the junction of the stomodæum with the mid-gut, and is known as the proventriculus, a very peculiar organ, which will be described in detail further on. If these parts be removed it will be seen that all else is muscle. Pressing apart the masses in the middle line, layer after layer (four in all) of longitudinal muscle can be clearly seen, filling up the greater part of the space. Further out there are numerous more or less obliquely vertical bundles. The whole constitute the muscles of flight; for the wing roots are not acted on directly by the muscles, as is the case with the ventral appendages, but in a very indirect manner by their action in producing an alteration in the form of the chitinous exoskeleton of the thorax, and thereby actuating a complicated series of sclerites which are connected with the wing roots. Any attempt to describe these muscles and their action here is, however, clearly out of place; and indeed, though much has been written on the subject it is very doubtful if any one has yet solved the problem of their mechanics.

The thoracic ganglion is mainly contained in the mesothorax just above its sternum, but the oval ends extend before and behind into the contiguous portions of the pro- and meta-thorax. Sections show that there are three principal ganglionic masses: a median commissural ganglion, which is divided into three parts, and lateral ganglia which are so continuous as to leave but little indication of the original separation into the ganglia of the three thoracic somites. The lateral branches of the ganglion have separate sensory and motor roots, and ends behind in a median and lateral branches which extend into the abdomen. There does not appear to be any difference in the anatomy of the nervous system from those of other flies, and those who desire a description of its details should consult some standard work on general dipterous anatomy, such as Lowne.

The proventriculus is a very peculiar structure which forms a sort of three-way junction between the œsophagus, crop duct, and mid-gut, and is situated in the prothorax, lying upon the cephalo-thoracic nerve cord and the front of the thoracic ganglion. Apart from certain differences of moulding, it is essentially the same in all Muscidæ, so

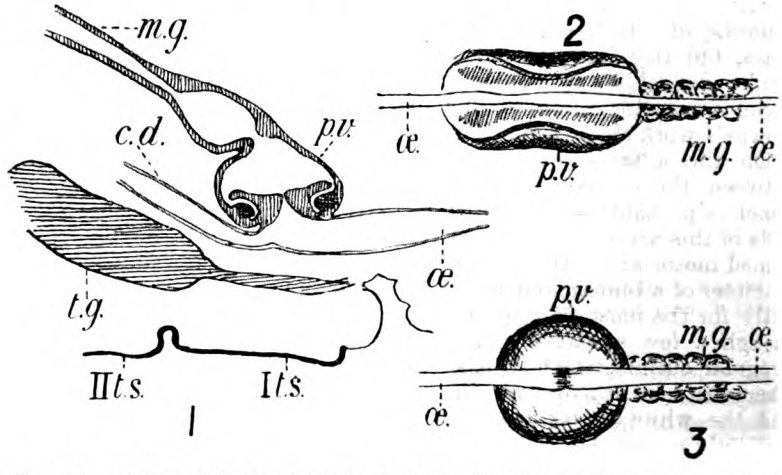


FIG. 27.—(1) Camera lucida drawing of a sagittal section of the proventriculus of Stomoxys and its connections, × 50 diams.; (2) and (3) freehand drawings of the proventriculi of *Glossina palpalis* and *Stomoxys calcitrans* respectively viewed from below; *Its*, *IIts*, first and second sternal sclerites; *cd*, crop duct; *mg*, mid-gut; *œ*, œsophagus; *pv*, proventriculus; *tg*, thoracic ganglion.

that our description of the organ will, with a few added words as to differences, serve equally well for *Stomoxys* and *Glossina*. The body of the organ consists of a fairly thick-walled bulb, from the dorsal surface of which springs the mid-gut, while the crop duct and œsophagus are connected with the ventral.

As will be seen from an inspection of fig. 1, the organ in *Stomoxys* closely resembles a retort, the beak of which is formed by the mid-gut.

The œsophagus and crop duct, which really form a continuous tube, give one the impression of entering the under-surface separately, as seen in dissecting, but do not really do so, the illusion being produced by the actually continuous tube being tucked up into the funnel-shaped aperture in the lower surface of the proventriculus.

In *Glossina* the junction is T-shaped, and there is a distinct vertical duct which runs up from the upper surface of the junction between the œsophagus and crop duct, so that, even to the dissector, the continuity of the latter is quite obvious. In both genera, however, the vertical diverticulum enters the proventriculus by piercing the centre of a very peculiar structure, which has exactly the form of a bone button, the sewing which would attach such a button to the cloth being represented by a stout peduncle, through which the vertical diverticulum passes to enter the cavity of the proventriculus. Concealed beneath the margin of the button is an annular thickening of the floor of the cavity, which is formed of peculiar clubbed cylindrical epithelial cells.

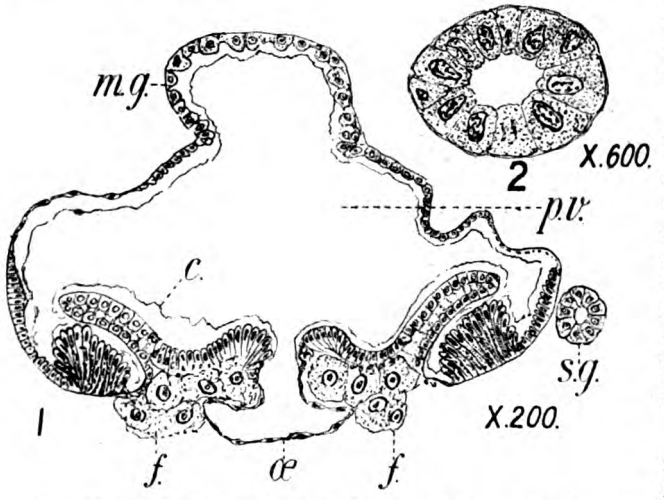


FIG. 28.—(1) Transverse section of proventriculus, × 200 diams; (2) transverse section of salivary glands; *c*, chitinous lining membrane; *f*, fat body; *mg*, mid-gut; *œ*, œsophagus; *pv*, cavity of proventriculus; *sg*, salivary gland.

A ring of somewhat similar structure, in the middle of the upper surface of the button, surrounds the almost punctiform opening of the vertical diverticulum. The lining, indeed, of this curious structure presents a sort of epitome of the various types of epithelial cell. Both surfaces of the remainder of the button are paved with cubical cells; outside the thickening beneath it the floor of the cavity is composed first of cubical and then of columnar cells; the lower part of the vault is composed of elements of the squamous form, and these change again to the cubical type, which, in its turn, gradually changes to the much larger irregular glandular type of cell which lines the commencement of the mid-gut.

The œsophagus and crop duct may be taken as chitinous stomodæal tubes, and it is a curious circumstance that this chitinous lining is continued through the vertical diverticulum into the proventriculus, and lines its entire cavity, though there appears to be no organic connection between this lining and the epithelial coat already described.

Though extremely delicate the structure is perfectly definite and continuous; and though fluids doubtless easily osmose through it, it seems rather difficult to understand how the products of the epithelial waste are disposed of. Taking the structure as a whole, it is difficult to resist the idea that it must, in some way, have a valvular function, though it is difficult to say how. The button is a solid mass of epithelia, and a most careful search through many series of sections has entirely failed to demonstrate any muscular components. The only way in which the puncture can be imagined to be closed by the structures as they stand is that the ring of club-shaped epithelia, beneath the button, if secreting actively, might swell and so cup the button more deeply, and that any such alteration of form would certainly tend to close the puncture. Weismann believes it to be glandular, and Lowne regards it as a gizzard, and there can be no doubt, as the latter points out, that it is homologous with the gizzard of manducatory insects, but it is difficult to see what a blood-sucking insect wants with such an apparatus, and as a matter of fact, but little changed red corpuscles of the victim are constantly to be found on the mid-gut.

In *Stomoxys* the proventriculus opens into the mid-gut by a very narrow opening, followed immediately by a bulb-like dilatation; after which the gut contracts to a uniform diameter for the rest of its passage through the thorax, but no such dilatation appears to exist in *Glossina*. In this genus, too, the button is oval instead of circular, and the entire organ is oblong with rounded corners and very slightly contracted in the middle. In addition to this (fig 27, 2), whereas in *Stomoxys* the organ is convex below in all directions, in *Glossina* the sides are curled round to protect the œsophagus and crop duct, so that, seen from below, it has much the form of a Spanish priest's hat.

The salivary ducts, almost immediately after entering the thorax, change from minute chitinous tubes to large tubular glands, and run back below the œsophagus to the sides of the proventriculus, and then below the digestive tubes to the abdomen. They are 0·08 mm. in diameter, and are lined with a cubical secretory epithelium, the components of which assume a keystone form on account of the smallness of the lumen. They have large nuclei with prominent chromatin fibres, and show neither anything in the way of a basement membrane nor any chitinous lining (fig. 28, 2).

On the dorsal side of the digestive tube, and lying in absolute contact with it, is the aorta, but the peculiarities of its structure will be better described in connection with the abdominal dorsal vessel.

(To be continued.)

THE PURU OF THE MALAY PENINSULA.

By T. D. GIMLETTE, M.D.

(*Continued from page* 175.)

CASE 3. *Puru in a Malay Adult.* — Mehlimah, female, Kelantan Malay, aged 47, married, twelve children, was first seen on April 14th, 1905, at Lubok Kawah in Kelantan. The patient states she has been ill for about a year, and has been inoculated with "puru mata kerbau" by her youngest child, aged about 2, who, with his sister, aged about 6, is now recovering from the disease. She says that all her children have had puru, but up till the present time she herself had not had it. Her husband suffered from it in boyhood; a married sister, however, has not yet had puru.

The patient looks ill. The eruption is sparse. She is crippled and complains of great pain in the hands and feet, and in the wrist, elbow and knee-joints. The joints are swollen and very tender. She is kept awake at night by the pains, and has been confined to the house for many months. She is still suckling the youngest child. On the left breast there is a flattened puru tubercle covered with a dark dry scab. There are some similar lesions on the abdomen about the level of the umbilicus, where the child would naturally be held in nursing. The shin-bones are much swollen and tender, as well as the phalangeal joints. The scar of the "puru ibu" in this case was on the right shin. The ibu sore had healed before the decline of the other sores, which, with the exception of those on the body, had mostly come out on the neck. This patient was given a mixture containing iodide of potash, 10 grains, night and morning, and an ointment composed of ung. hydrarg. 1 drachm, and zinc ointment to 1 ounce. She was greatly benefited by it, and by the end of April was free from pain and able to walk alone. At the end of May the sores had all healed.

CASE 4. *Puru in a Sikh.*—Pak Singh, a Sikh, of no occupation, aged 39, was admitted to the General Hospital at Kuala Lipis, Pahang, on February 2nd, 1900. He had been ill for a few days, and was supposed to be recovering from chicken-pox. He was removed to an isolation ward, where the eruption developed into one which was generally recognised as puru. The patient gave a definite history of primary syphilis, and was not discharged until April, and then only partly cured, although treated with mercury as well as iodide of potash during the whole of March.

This case appears to be analogous with the clinical case of the sea dyak given by Dr. Barker in his report from Sarawak.

THE PATHOLOGY OF PURU.

There is little in the pathology of puru which has not already been described under the heading of frambœsia or yaws.

The disease being seldom fatal, it is impossible to record the result of any *post-mortem* appearances, more especially because *post-mortem* examinations are almost prohibitive among Malays owing to religious custom and strong racial prejudice.

Microscopical Appearances of Puru Tubercles.—Some of the growths which were removed from the chin and back of Case 2 were sent to the Institute for Medical Research, Federated Malay States, and were, by the courtesy of the Government, examined by Dr. C. W. Daniels, the Director of the Institute. His report is as follows:—

"*Tubercle from Back.*—Nodule mainly composed of a round-celled growth in the tissue, covered almost completely by altered epithelium. The growth is not one mass, but is formed of a series of nodules of irregular size and shape loosely connected by fibrous tissue.

"On tracing the epithelial layer from the normal skin at the edge of the nodule we find that over the tumour it is more irregular in thickness and that the papillary processes are larger and very irregular. All the layers are altered. There is no properly formed keratinous layer and none of the intermediate cells in process of keratinisation. The epithelial cells over the tumour are swollen, stain irregularly, and are often vacuolated.

"They are not arranged in definite layers and the palisade arrangement of the deepest layer is poorly marked.

"The growth itself is composed of round cells with scanty protoplasm. The cells and nuclei stain well with basic stains. Mitosis is common and there are no areas of necrosis, caseation, or suppuration. The cells vary a little in size and occasionally much larger cells with single nuclei are seen. In the depth of the growth there is some thickening of the fibrous stroma. The growth is supplied with blood-vessels.

"*Tubercle from the Chin.*—This specimen is from a more hairy part and hair follicles extend through the growth. It differs from the other specimen in that the growth is less abundant and the fibrous stroma more so and that the hair follicles extend through the depth.

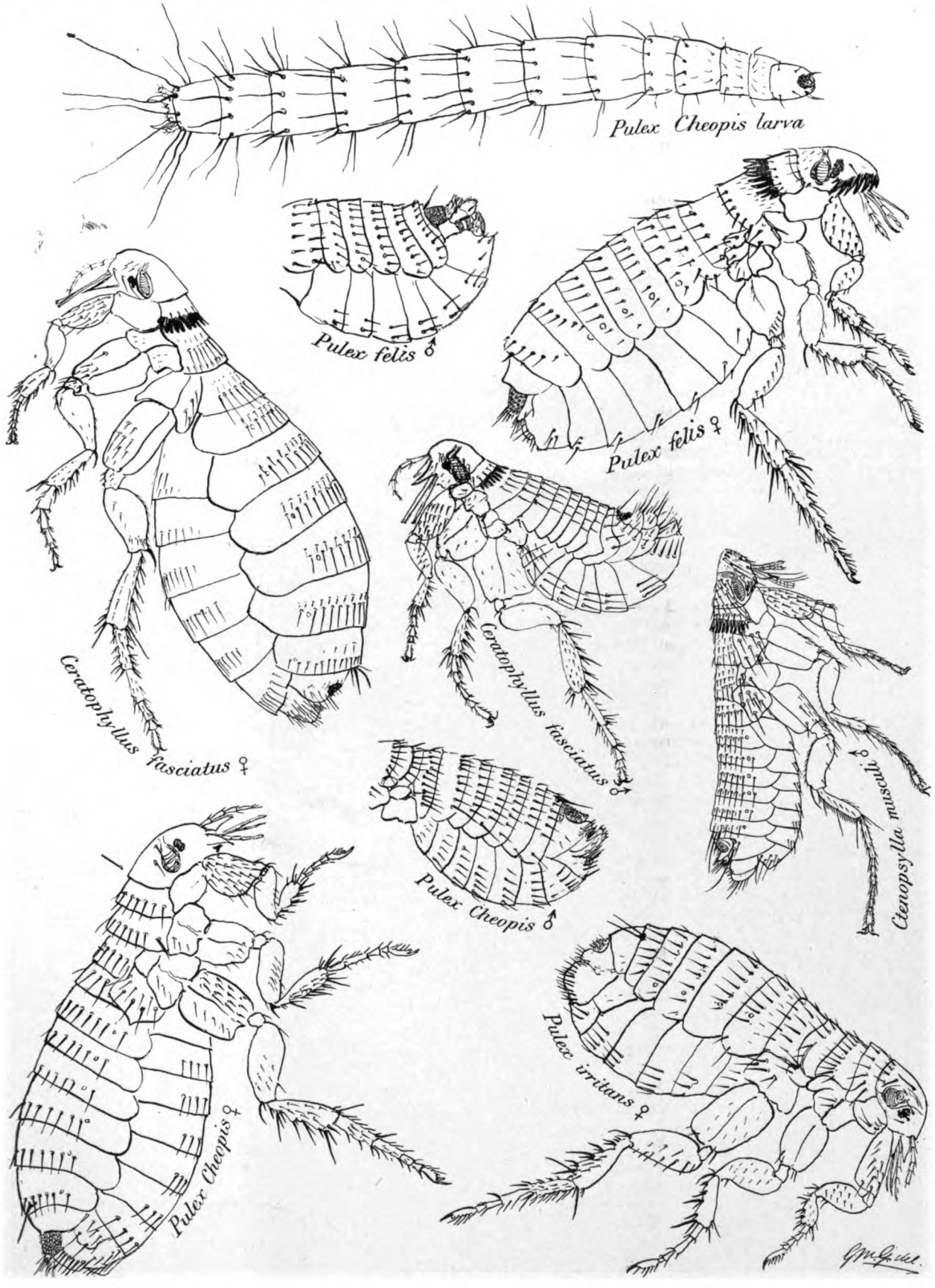
"No micro-organisms were found in the deeper parts of the sections of the growths."

This description agrees with the most recently published account of the microscopical appearances of frambœsia or yaws tubercles [20]. It is important to note that no congener of the *Spirochæte pallida* was found. The original sections are sent with this paper.

THE TREATMENT OF PURU.

Malays have given much attention to the treatment of puru, both with drugs derived from their own flora and by the use of a few imported medicines, but their efforts, which are mainly empirical, have not proved very successful in every-day practice.

In the hope that a definite therapeutic preparation might be made out of one or other of their local products, I recently sent some notes to the Therapeutical Society of London, on some of the methods employed by Kelantan Malays in the treatment of puru. Botanical specimens of most of the plants referred to were sent to England with the paper. They were all obtained in Kelantan, most of them from a hamlet—Kampong Kutan—near Kota Bharu, the capital. These original notes, with additions, are now embodied in the present essay.



Outline figures of fleas possibly concerned in the transmission of plague.

Native Therapeutics.—In the earliest stage of the disease the only native form of treatment employed for the relief of the prodromal fever and muscular pain is the superstitious Malay practice of "menjampi," or charming by incantations.

The medicine for the first stage of puru is said by native Malay doctors to be the leaf of the merbor (?), plant and those of the jenera (?) rotan jenerang (*Dæmonorops draco* [L. Palmæe], the dragon's blood). These leaves are chewed up and spat on to the swelling or ibu.

It is generally held by Malays, however, that active treatment is of no avail until the full development of one or more puru sores has been attained. The sore which is often watched with the object of timing the commencement of treatment is the "puru ibu," or mother sore. When this so-called parent sore is developed, their most valued remedy is the external application of a latex or kind of gum which is called "geta hagu" in Kelantan, or "getah jintan" in Pahang. This is obtained from a climbing jungle creeper known in Kelantan as "akar agu" ("akar," a root, the generic name for scandent or creeping plants) and is very like *Hunteria roxburghiana*, though uncommon. It is prized by Malays, especially a red variety, and, like many other of their medicinal plants, is protected and cultivated. The latex is obtained by cutting the live stem and mixing it with water to allow for its inspissation, and it may be bought in this form in the native market at Kota Bharu in Kelantan. The remedy is smeared day by day on the sores of the general eruption. So far as my experience in Kelantan goes, "getah agu" causes the sores of puru to shrink and is of value as a local application.

Another latex which is valued is collected from a jungle creeper called "akar gam" (*Willoughbeia firma*); in this case the remedy is obtained by incising the fresh fruit or the stem. It is generally known under the name of "buah gam" or "gehan" ("buah," a fruit), and is commonly applied to the sores of puru in the same way as "getah agu." In some cases in which the sores are chronic and do not respond to treatment the fruit is gathered, dried, then roasted and powdered, being finally made into a paste with a little water for local application. In other cases of chronic and recurring sores, the ashes obtained by burning the stem of "rotan sega badak" (*Calamus orantus*) are used. "Rotan," in Malay, is a generic name for rattans of the genera *Calamus* and *Dæmonorops*.

Another local Malay remedy is well known under the name of "terosi," sulphate of copper. In the general treatment of puru, "terosi" is reduced to fine powder, and then mixed with palm oil or with a latex called "getah pulai," which is obtained by cutting the stem of the young pulai tree (*Alstonia macrophylla*). External applications of this kind containing "terosi" cause a great deal of pain, prevent sleep, and on this account are not often used, rarely if ever being employed in the early stages of puru. With the object of preventing pain these applications are sometimes prepared by first burning the "terosi" in a slow fire until it is blackened, then pulverising and mixing it into a paste with either cocoanut oil or the juice of the common lime fruit called "limau nipis" (*Citrus acida*).

The most important of all the Malay drugs for sale in the Kota Bharu market is "tuba tikus," which, like terosi, is imported by way of Singapore. "Tuba tikus" is pure arsenious acid or white arsenic, generally seen in rather odd forms which seem to be due to its having been collected from the flues of some dyeing works. The name appears to be used idiomatically by Malays; "tuba," is the name of a jungle plant, the root of which possesses certain stupefying properties; "tikus" signifies a rat. It is used externally in the treatment of puru, either by itself in the form of a powder, or as an addition to various kinds of roughly made "pastes" which are prepared from certain native plants. These vegetable "pastes" are freshly made as occasion demands; in one instance by grinding down with a little water the root of a wild red vine, called in Malay "puchok merah" ("merah," red), a plant which is identical with *Leea rubra*, and in another case by treating in the same way the root of a low shrub called "chekor manis" (*Sauropus albicans*); "manis" is the Malay for sweet, or light in reference to some colours.

"Taba tikus" is used as a poison by criminals, and is not administered internally as a medicine by Malays. It is the "berangan puteh" of Java.

The sulphurets orpiment and realgar are also used in puru, but all the external applications containing arsenic, being caustic, are much disliked on on account of the pain which they occasion. "Tuba tikus," like "terosi," may be burnt and applied in the same way, either with or without oil.

"Mali puchok merah" is given by the mouth for puru, as well as being used externally, and among other internal remedies are "melor hutan," a wild jessamine (*Jasminum bifarium; Oleaceæ*) and the black variety of kemantu. This latter is a tree of Indian origin (*Clausena excavata*). It is called "pokoh kemantu hitam," or the black kemantu tree, "pokoh" meaning a tree, and "hitam" black. There are other varieties of this tree which are not used in medicine. "Akar jela batu" is also administered internally for puru; but there is no fixed dose. In each case the roots of these plants are ground down on a "batu asah" (a stone on which medicines are pounded or ground down) and then infused in cold water. Occasionally a mixed infusion is used in puru of kemantu hitam and "tuko takal" (*Baccaurea wallichii*; *Euphoribiaceæ*), a jungle tree which is fairly common.

The only treatment of the disease by Malays when it affects the joints is by the constant application of "ayer tawar," or plain water over which certain charms have been said.

In Kelantan sovereign remedies are common. A typical native prescription is as follows: Take the knee-cap of a tiger, the bones of a duyong (the dugong), the bones of a goose, the bones and horns of a Kambing gurun (a very rare wild goat, *Nemorrhædus bubalinus*), the horns of a rusa, a wild deer (*Cervus unicolor*), while still soft (lembong); add belirong bang (sulphate of arsenic), and chendana janggi (red sandal-wood), and mempus harimau (a kind of wood). Grind these ingredients down with some boiling rice water (ayer dideh), take a small amount of ashes

from the hearth, mix, and administer the draught by the mouth.

Various applications are made for puru of the foot. The following method of treatment known as "tanak puru" ("tanak," to cook) is a favourite one with some Kelantan Malays. A small round hole about a foot in depth is made in the ground, and a slow fire is kindled at the bottom of it; half a cocoanut shell with a hole in it, or a suitable piece of bamboo, is then fitted over the red-hot embers. On the top of this improvised screen the affected foot is rested in such a way as to expose the sore to the heat of the smouldering fire. Kemantu leaves are often put on the fire as well as those of "kedondong," a tree belonging to the genus *Canarium*; in addition to the leaves the bark of the latter is sometimes burnt on the embers. Relief of pain is obtained after three or four lengthy exposures.

Lime, which is commonly used in betel chewing, is also a popular remedy for puru of the foot. It is mixed with oil or with the juice of "keladi puyoh," a common Malay ariod of the genus *Alocasia* (*Typhoaium roxburghii*), and plastered on to the sores. Stones may be heated and applied as hot as can be borne. The actual cautery in the shape of red-hot iron nail is occasionally used, and even excision is attempted by means of "parangs" or rough iron choppers which are usually used by natives in felling brushwood.

It is of general interest to note that the drugs used in puru are not used by Malays in their treatment of syphilis. The chief Malay drug used for syphilis is "pokoh restong" (*Malacuœ sp.*) which grows wild, but is often cultivated, and it is praised by natives as being a valuable medicinal product. The root is used, mostly in the form of a lotion, especially in cases of ulceration and destruction of the nose. This as well as "trong pipit puteh" (*Solanum indicum*) is also given internally for syphilis, but they are not employed in the treatment of puru. "Puteh," in Malay, literally means white, and the word "trong" is used to designate the plants of the *Solanaceœ*.

Hospital Treatment.—At the present time puru is rarely, if ever, treated in the isolation wards of the Malay peninsula. It is hardly necessary to dilate upon the importance of isolation in the case of a directly contagious disease of this nature. I think it may be assumed that some isolation of puru cases (although prophylactic treatment of this kind must always be difficult among Malays) may be eventually achieved in these hospitals.

Preparations applied locally of mercurial ointment will be found of great value in the treatment of the disease, especially in combination with zinc ointment. Sores which are healing during the decline of the disease are generally benefited by daily applications of tincture or liniment of iodine. Puru of the foot is often relieved by the application of pure carbolic acid or sulphate of copper. I have not found alkaline lotions of sodium bicarbonate to be of much benefit. Iodine of potash is generally of great value, especially during the stage of "senggai puru." It quickly relieves, as a rule, the rheumatic-like pains if given in doses from 5 to 10 grains (to adults) twice or thrice daily. Attention to general hygiene and cleanliness is nearly always indicated. The syrup of iodide of iron is often of great service in the treatment of puru during childhood.

Although my practical acquaintance with the disease is limited to the Malay peninsula, I would conclude that puru is identical with frambœsia or yaws, and I would plead that this tropical disease should at least rank as a nosological entity in the medical returns of British Malaya.

I am indebted to Mr. H. N. Ridley, F.L.S., Director of the Botanic Gardens, Singapore, for his kindness in classifying very many of the drugs, and to Mr. P. Burges, M.A., Government Analyst, Straits Settlements, for his examination of the mineral known as "tuba tikus," or ratsbane; also to Mr. R. W. Duff, Managing Director of the Duff Development Company, Limited, to Mr. H. W. Thomson, Assistant Adviser to His Highness the Rajah of Kelantan, and to Ungku Sayid Hussein, a member of the Kelantan nobility, for their cordial collaboration.

I must also thank Dr. C. W. Daniels, the Director of the Institute for Medical Research, Federated Malay States, for making the examination of the pathological tissues and for many kindly and valuable criticisms.

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THE

Journal of Tropical Medicine

JUNE 15, 1906.

THE HYGIENE OF THE ALIMENTARY CANAL.

PROFESSOR METCHNIKOFF chose the subject of "The Hygiene of the Alimentary Canal," for his second Harben Lecture. The etiology of appendicitis formed a prominent part of the lecture, and Metchnikoff's opinion is that intestinal worms are the most frequent cause of the disease. He cited instances in which Trichocephali, Oxyures and Ascarides have been found in the appendix, and drew attention to the prevalence of appendicitis in families and persons subjected to identical domestic environment. It is not necessary for belief in this opinion that the worm be actually found in the appendix either at operation or at *post-mortem* examination, for, after having caused inflammation in the appendix, the parasites frequently leave the appendix and thus may not be found there at the time of the operation. There can, of course, be no doubt that an intestinal worm need not impair health in any way, just as many mosquitoes, fleas, and ticks may prick man and animals without causing anything more than a transitory and not painful itching. But, on the other hand, it is equally certain that the bites of intestinal worms may lead to just as much evil as the pricks of Arthropoda carrying pathogenic microbes.

In the appendix the parasite sets up a zone of inflammation accompanied by an effusion of white blood cells and the presence of different bacteria; the mucous membrane is attacked and the parasite (oxyuris or other worm) inoculates a microbe which produces a fatal infection. The *rôle* of the parasite is therefore similar to that of a flea which inoculates man with the plague bacillus. As an argument against this theory of the causation of appendicitis, it is asserted that the Chinese and certain other peoples never suffer from appendicitis, in spite of the frequency with which intestinal worms are found in them. It may, however, be stated (1) that *post-mortem* examinations are but rarely carried out in China, except in some few centres where European doctors practise; (2) that appendicitis is frequently a mild ailment, and European doctors are seldom called in; (3) the statement that appendicitis is so rare amongst Chinese requires confirmation.

The disinfection of the intestine Metchnikoff considers to be a simple matter, and can be produced by keeping a careful watch on our food and drink; both should at least be boiled before being consumed. He refutes the belief that boiled water is either tasteless or harmful, and contends that boiling is insufficient for sterilisation—there always remain spores of *Bacillus subtilis* and some others—but the ova of parasites and the pathogenic microbes will be destroyed, almost without exception.

Among fruits, strawberries are chiefly condemned as parasite introducers, from the fact that they touch the ground or litter when growing. In connection with this legend the use of strawberries as a cure for sprue would require justification, seeing that the fruit comes in contact with an already damaged intestine. As an intestinal disinfectant lactic acid is recommended by Metchnikoff as the most efficient, and he states that—

"Among the useful bacteria the place of honour should be reserved to the lactic bacilli. They produce lactic acid, and thus prevent the development of butyric and putrefactive ferments, which we should regard as some of our redoubtable enemies. It has been shown by an extensive series of experiments, which we cannot here treat of in detail, that certain lactic ferments easily accustom themselves to live in our intestines, and thus produce a beneficial influence. They prevent putrefaction, and thus diminish the excretion of sulphonic acid esters. These same ferments help to regulate the functions of our intestine and kidneys, rendering valuable service to the entire body.

"One can take such carefully selected lactic ferments either in milk that has become acid under their influence or in the form of a powder or compressed 'tabloids.' Dr. Tissier employs them in the treatment of the various intestinal troubles occurring at any age. To this end he advises the use of cultures of lactic microbes made in lactose peptone water.

"As putrefaction in the alimentary canal represents one of the causes of the general wear and tear of the human body, it was only natural to suggest the method that I have just referred to as a means of combating it. This method may now be summed up in a few words. It consists in the consumption of foodstuffs not contaminated with microbes or entozoa, and in the introduction into our alimentary canal of an artificially cultivated bacterial flora, foremost among which are the lactic acid microbes."

HOW TO RECOGNISE THE SPECIES OF PULEX POSSIBLY CONCERNED IN THE TRANSMISSION OF PLAGUE.

THE theory that fleas are concerned in the transmission of plague is one of some standing, but was for a considerable period generally discredited, as it seemed that laboratory experiments failed to confirm its probability.

Of late the theory has, however, come once more to the front, owing largely to the able advocacy of Captain W. Glen Liston, I.M.S., who contributed to the Bombay Natural History Society a paper on the subject, read on November 24th, 1904. A revised copy of this paper appeared in this Journal in the issue of February, 1905, p. 43, and an earlier note on the fleas of rats, contributed by Dr. Tidswell, may be found in the volume for 1903, p. 232.

It is not our purpose to enter into any detailed description of the various species that may possibly be concerned in the transmission of plague from the rat to man, but as neither of these papers was illustrated, and no easily recognisable figures can be referred to as readily accessible, it is thought that it may be of service to our readers to furnish them with reliable outlines of the five species that are most likely to be met with in the course of any investigation of the subject. The material from which the drawings were made consists of a number of slides presented to the writer by Captain Glen Liston, and partly of some rat-fleas collected by himself in Plymouth.

All are mounted as microscopic objects in balsam on ordinary slides, and hence are probably a good deal more compressed than the living insects would be, or than is the case in specimens preserved in spirit. The depth of the drawings from dorsum to venter is therefore, probably, in all cases more or less exaggerated. The various specimens were most kindly identified by the Hon. Mr. Charles Rothschild, the well-known authority on the group, to whom the writer desires to express his most grateful thanks for his pains in this respect, as well as for his help in indicating the points that should be most emphasised in preparing outline figures of fleas, and for the loan of his unique specimen of the larva of *Pulex cheopis*, the species which is indicated by Captain Liston as the most probable culprit in the matter.

The fleas are a small group of parasitic insects, the *Aphaniptera*, which are generally regarded as a sub-order of the Diptera, though it cannot be said that the relationship is a very obvious one, as, not only are the wings represented only by small scales on the meso- and meta-thorax, placed just above the coxæ, but the hinder pair are usually the larger, and in no way resemble the halteres of the Diptera. Added to this, the mouth-parts are very different, notably, in possessing, in addition to the palpi, a second pair of jointed appendages.

Although no monograph of the *Pulicidæ* appears to have been as yet attempted, the total number of species must be considerable, as most genera of mammals and birds appear to have their own fleas, which are but rarely found on alien hosts. This, however, appears to be rather a matter of preference than of necessity, as, if pressed by hunger, fleas will attack almost any species, and as they always quickly desert their host after the death of the latter, other animals and human beings are, under the circumstances, very apt to be attacked by species that ordinarily neglect them. The significance of this trait of their habits in relation to the transmission of plague is too obvious to need further comment.

On this account, not only may the fleas of cats, rats, and even birds be found on men, but the fleas of the latter may be met with on rats, and of course the fleas of mice and other rodents find a comparatively congenial home.

For our purposes, however, there are five species whose ready recognition is like, ere long, to become a matter of vital importance to the medical practitioner. These are : *Pulex irritans*, usually harbouring on man ; *Pulex felis* (often referred to as *P. serraticeps*), commonly harboured by dogs and cats, but quite commonly met with on the human subject, as well as on rats, squirrels, and a variety of other animals ; *Pulex cheopis*, the common rat-flea in India, which, according to Captain Liston, appears to have a preference for *Mus rattus ; Ceratophyllus fasciatus*, common on rats in all parts of the world, and showing, according to Liston, a preference for *Mus decumanus* ; and *Ctenopsylla musculi*, normally harbouring on the mouse. In distinguishing between the above, the following points need alone be noticed :—

(1) The presence or absence of eyes. These organs are very rudimentary in all fleas, the compound eyes of the majority of insects being absent in the entire suborder. In *Pulex*, and allied genera, simple eyes allied to those of the young nematocerous larva occupy the position of the usual facetted eyes, but they are always small, and can hardly be capable of anything more than the bare appreciation of light. It is sometimes rather difficult to determine whether a species be blind or otherwise, as a pigmentary mark sometimes occupies the position of the eye, and may, of course, even really represent it, as the eye in its most rudimentary form is nothing more than a patch of pigment. *Ctenopsylla musculi*, the only blind species on our list, is, however, fairly obviously eyeless, and so can easily be distinguished from the rest.

The second point requiring particular notice is the presence or absence of serrated edges to certain sclerites, notably the inferior border of those forming the sides of the head, and the posterior border of the tergum of the prothorax. In this latter position they have the appearance of a spiked collar. Mr. Rothschild has recently described a flea possessing a mesothoracic collar of this sort, but this need not concern us here. Lastly, the posterior borders of some of the abdominal terga may show a tendency to this form of armament, the anterior segments of one of our species, *Ctenopsylla musculi*, possessing from one to three teeth on either side, but these are not easily made out in specimens mounted in balsam.

Fleas of the same species vary so widely in size that this character is practically valueless for purposes of identification.

These points being duly noted, our five species may be tabulated as below :—

I.—Species possessing obvious eyes.

(*a*) With both the inferior border of the head and the hind border of the prothorax serrated.

(1) *Pulex felis.*—Eight serrations to lower border of head, the hindmost much smaller than the rest. Prothorax with eight serrations on either side. Tarsal claws of moderate size, but stout.

(*b*) Lower border of head unarmed but prothorax serrated.

(2) *Ceratophyllus fasciatus.* — Prothoracic collar with ten serrations on either side. Tarsal claws small and delicate. The profile of the head curves down much more sharply to the vertical than in preceding or following species.

(*c*) Species with neither inferior border of the head nor the prothorax serrated.

(3) *Pulex cheopis.*—Tarsal claws short and delicate, antipygideal bristles long.

(4) *Pulex irritans.*—Tarsal claws long and scythe-like, antipygideal bristles short.

II.—Blind species.

(*a*) With the inferior border of the head and the prothorax alike serrated.

(5) *Ctenopsylla musculi.*—Inferior border of head with 4, and posterior border of prothorax with 11 serrations. Tarsal claws small and delicate. Profile of head sloping markedly backward, after it turns downward, producing an outline like that of the head of "Ally Sloper" of the comic papers.

We could have wished to complete the list with representations of the fleas harboured by monkeys, the familiar Indian verandah squirrel, and the Himalayian marmot, all of which animals are probably occasionally concerned in the spread of plague, but material is lacking. Perhaps some of our readers can supply us with the desired specimens, which should be sent, preferably, preserved in spirit.

Pulex cheopis is believed by Mr. Rothschild to be essentially peculiar to the hotter parts of the globe, but it is certain that it can maintain itself in temperate climates, as a specimen was taken by the writer on a rat caught in Plymouth. As a great naval arsenal, and considerable seaport, the town is in constant communication with all parts of the world, so that it is easy to understand its reaching there on a rat imported by some ship. The fact, however (which has already been published in an entomological periodical), is extremely significant of the dangers to which seaports are exposed. G. M. G.

R. KOCH ON TUBERCULOSIS.

In the Nobel Lecture, published in the *Lancet*, May 26th, 1906, Professor R. Koch drew attention to the infectious nature of tubercle, and to the necessity for notification of the disease. He stated that Bovine tuberculosis and human tuberculosis are different from one another, and in connection with the combating of tuberculosis it is only the tubercle bacilli emanating from human beings that have to be taken into account. Of tubercular persons, it is only those who suffer from laryngeal or pulmonary tuberculosis, and whose sputa contain bacilli that are dangerous to those around them in a noteworthy degree. This form of the disease was even called the "open" in contrast to the "closed" form, in which no tubercle bacilli emanate from the body in a dangerous form. In the open form of tuberculosis the patient is dangerous only when he is personally uncleanly, or becomes far advanced and more or less helpless in the disease.

The measures hitherto adopted for the arrest of tuberculosis are: notification, hospitals, sanatoria, and the instruction of the people as to the danger of tuberculosis. Of these the first and last are the most essential. "We must demand notification for tuberculosis" is Professor Koch's view, and all epidemiologists will agree. In a certain way notification is really taking place, as pulmonary phthisis is treated in many hospitals. The benefit of sanatoria is doubtful, and it is only in the early stage of tuberculosis that treatment in a sanatorium is of real use.

"PHILIPPINE JOURNAL OF SCIENCE," FEBRUARY, 1906.

INOCULATION AGAINST PLAGUE.

STRONG has inoculated man with attenuated *Bacillus pestis* with promising results. In all, 42 persons have been treated with one twenty-four-hour agar slant culture of the living bacillus, suspended in 1 cc. of 0·85 per cent. saline solution. The material was injected deeply into the deltoid muscle. Strong used a culture of attenuated strength, having obtained two attenuated cultures of the bacillus from Professor Kolle, and made use also of a three-year-old culture, started in Manila, still further reduced in strength, according to Otto's method.

After the injection the patient had slight pains at the seat of inoculation and a febrile state for a day or two, but no serious complications, either locally or constitutionally, resulted.

Of the several sera used as prophylatic or curative agencies in plague, the best known are: (1) Yersin, in 1894, prepared an anti-toxic serum by injecting the bacillus of plague into horses, and killed before use, by heating to a temperature of 136° F. (2) Haffkine, in 1897, used a pure culture of the bacillus in bouillon containing ghee, the bacilli being killed by exposure to a temperature of 158° F. for an hour. (3) Kolle and Otto, in 1902, inoculated guinea-pigs with attenuated living plague bacilli, and showed that these animals can be rendered immune to plague. (4) Strong, as stated above, has now adopted Kolle and Otto's method for human beings; the only special warning he gives is that every care must be taken in the preparation and attenuation of the virus.

YELLOW FEVER.

THE members of the French Commission for the study of yellow fever have issued their report. The conclusions are: (1) That the *Stegomyia fasciata* is the agent by which yellow fever is transmitted, thus confirming the observations of Reed, Carroll, Lazear,

and Agramonte. (2) The mosquito can only acquire power of infection by biting yellow fever patients during the first three days of the patient's illness. (3) Twelve days must elapse after the mosquito has imbibed the virus before its bite can infect human beings. (4) The infected mosquito retains its power of infecting man as long as it lives, namely, twenty to thirty days. (5) The *S. fasciata* requires human blood for the development of her eggs. (6) The first generation of the offspring of an infected mosquito seems capable of transmitting yellow fever fourteen days after reaching full development.

The micro-organism of yellow fever has not been isolated, but the following observations were made: (1) The organism does not exist in human blood after the fourth day of yellow fever. (2) It passes through the Chamberland filter F., but is retained by filter B. (3) The organism is destroyed by exposure to a temperature of 131° F. for five minutes. (4) The blood serum loses power of infection after exposure for forty-eight hours to air. (5) When defibrinated blood is protected from the air the serum retains its potency after five days but not after eight. (6) When dead infected *S. fasciatæ* are injested by non-infected *S. fasciatæ* infection results; but this infection only holds good for the first feeding.

As regards immunity, the members of the Commission conclude that: (1) An attack of yellow fever yields immunity usually permanent in this character; should a second attack occur it is of a mild type. (2) Serum kept at 131° F. for five minutes confers a relative immunity when injected into human beings. (3) The same is claimed for defibrinated blood kept under vaseline from air for eight days. (3) No race is naturally immune, but the mosquito seems attracted by certain skins.

Isolation of the patient and destruction of the *Stegomyia fasciata* seem to be the chief points indicated in warding off the spread of yellow fever.

The members of the Commission favour the idea that the micro-organism is of the nature of a spirillum.

Experimental Myiasis in Goats, with a Study of the Life Cycle of the Fly used in the Experiment and a List of Some Similar Noxious Diptera.[1]

By F. C. Wellman, M.D., Benguela, Angola, West Africa.

Abstract.

Dr. Wellman, in elucidation of this subject, employed a fly pronounced by Mr. E. E. Austen to be a species of *Sarcophaga*, near *regularis*, Wied. The animal experimented upon was a native goat of Angola.

The goat was chloroformed, placed under a mosquito net, and the nostrils of the goat painted with water in which pieces of putrid meat were soaked. Some 70 flies were then liberated beneath the mosquito net. The flies could be seen to settle upon the goat's nostrils. On the second day the goat appeared to be ill, it was killed on the third day, when the posterior nares and the frontal sinuses were found to be extensively eroded, swarming with maggots, and the air passages covered with a thin, glairy, foul-smelling pus. The experiment was tested by control animals. Dr. Wellman concludes that men and animals might be invaded by the fly in question under certain circumstances. A man sleeping in the open, especially if suffering from ozæna, would be liable to be attacked by the fly; any uncovered wound would also become affected.

A list of Diptera convicted of causing human myiasis is given by Dr. Wellman:—

Clyclorrapha — Schizophova — Muscidæ — Calyptratæ.

Oestridæ.

Gastrophitus. Horses and man.

Hypoderma. H. bovis, man. *H. diana*, deer and man.

Dermatobia. The larvæ of *D. cyaniventris* is the "Ver Macaque" of tropical America, and in man causes painful boils, occasionally attacking the eyes; also *Hypoderma bovis* reported by Scheube.

Sarcophagidæ.

Sarcophaga. S. carnaria, S. magnifica, and *S. rufi-cornis* occasionally deposit their larvæ in wounds of man (India). A species of this genus (*S. sp.* near *regularis*) is the fly used in the experiment detailed in this paper.

Sarcophila. Man and animals.

Auchmeromyia. A. luteola, in Angola, and another species (*A. depressa*), cause cutaneous myiasis in Natal.

Ochromyia. The larva of *O. anthropophaga* is the "Ver du Cayor," which in Senegal produces cutaneous inflammation and swelling.

Muscidæ.

Musca. Larvæ of *Musca sps.* occasionally are passed in fæces or found in wounds.

Calliphora. In intestines of man and animals.

Compsomyia. The larva of *C. macellaria* is the "Screw-worm" of tropical America.

Lucilia. L. sericata is the cause of "maggot" in sheep. The larvæ of several species of *Lucilia* have been detected in wounds and ulcers in man and animals.

Anthomyidæ.

Anthomyia. The larvæ of *A. canicularis* not seldom get into the stomach and intestines of man, through eating raw vegetables.

Hydrotæa. In the fæces of human beings.

Homalomyia. In the intestines of man, being passed alive in the fæces. Osler gives a case of infection by *H. scalaris* in Louisiana.

Hylemyia. In human excreta.

[1] A paper sent to the American Society of Tropical Medicine.

Correspondence.

To the Editors of the Journal of Tropical Medicine.

"ZAMBESI ULCER."

(Letter from Dr. F. C. Wellman.)

Sirs,—May I be permitted to remark in your columns on the criticism of the article by Mr. L. E. Ashley-Emile with the above title (this Journal, September 15th, 1905), which

FIG. 4.—To illustrate Case 2, showing the sores of puru.

FIG. 5.—A group of Malays at Dusun Nyor, in Kelantan, showing the prevalence of puru among the children of the village.

To illustrate article by T. D. GIMLETTE, M.D., "The Puru of the Malay Peninsula."

Bale & Danielsson, Ltd., London.

Mr. J. E. S. Old offers in your February 15th, 1906, number?

While I am not acquainted with the exact region described by Mr. Ashley-Emile, yet I have had some experience with skin diseases in the same latitude—from the Portuguese west coast to the head-waters of the Zambesi—and have often seen the common ulcers described by him (*vide* my "Notes from Angola," Note xviii., this Journal for December 1st, 1905, p. 344). I have also seen a number of cases of cutaneous myiasis, and am not inclined to regard the occasional presence of dipterous larvæ in ulcers in the light of an etiological "discovery." As for the impression conveyed by the author's paper, *i.e.*, that "Zambesi ulcers" are always connected in the first instance with the presence of muscid larvæ in the skin, such an opinion is not confirmed by my observations west of his district, where all ulcers, especially early ones, were closely scanned for Guinea-worms. On the other hand, I should say that the presence of the larvæ was exceptional.

I believe the author is right, however, in stating that the usual larva seen under the skin in this part of the world is distinct from *Bengalia depressa* (which, however, is also seen, but more rarely), for my specimens taken in the interior of Angola in nearly the same latitude, are certainly not to be identified with that species. Neither are they, on the other hand, to be confounded with the muscid larvæ, Blanchard's description of which is quoted in the article under discussion. Regarding this point, Dr. L. O. Howard, Chief of the Bureau of Entomology at Washington, writes (May 10th, 1905) to the Secretary of the American Society of Tropical Medicine concerning my specimens in the following words: "The larva removed with a pair of forceps from under the skin is most interesting. It appears not to be a Muscid, but its affiliations are with the *Sarcophagidæ*, the true flesh-flies; but I know of no record of the occurrence of a larva of this family under the skin of a human being. Still, new things are coming up all the while, and we may have here something absolutely novel." The *Sarcophagidæ* are important pests in this region, and I have seen the vivaparous females depositing their larvæ in wounds. I have also recently produced experimental destructive myiasis in goats, using *Sarcophaga africa*, Wied. and *S. albofasciata*, Macq. (*vide* the *Journal of Medical Research*, vol. xiv., No. 2. January, 1906, p. 439). It would seem probable that Mr. Ashley-Emile is dealing with some such fly as the above, or possibly with *Muscidæ*, as he believes. In any event, his finding of the larvæ, presumably in a number of ulcers, on the Zambesi (he, unfortunately, gives no figures) is an interesting observation, in spite of the unscientific and pompous manner in which it is announced, and, although he is unjustified in including without evidence (and without reference to the work of Harman, Ogston, and others, *cf.*, also my memorandum in this Journal for April 15th, 1905, p. 118), the veldt sore of other places in his category of maggot-caused phagedæna, yet it is to be hoped that fly larvæ will now be carefully looked for in all cases of African ulcer.

While waiting for confirmatory evidence, however, since in my own contiguous district cutaneous myiasis is not uncommon, while the formation of ulcers around the larvæ is, to say the least, very rare, and as I have seen no other evidence, in the course of considerable study of such conditions, to justify one in predicting a causal relation between the two conditions, I am unable to accept Mr. Ashley-Emile's etiological theories regarding veldt sore as established even for Zambesia, and agree with Mr. Old in suggesting that he should go over his work again, giving us case records, statistics, and what other exact data he has by him, instead of hasty generalisations and self-congratulatory phrases.

Hoping that you will pardon my occupying so much of your valuable space. Yours, &c.,

F. CREIGHTON WELLMAN.

South Angola.
April 15th, 1906.

Report.

SHANGHAI HEALTH DEPARTMENT.

ANNUAL REPORT FOR 1905.

ARTHUR STANLEY, M.D., B.S.Lond., in his annual report, just issued, on the health of Shanghai, states that "the past year has been the healthiest on record."

The death-rate amongst the 11,497 Europeans resident in Shanghai amounted to 11·2, as against 12·9 in 1904. Amongst a Chinese population of 452,716 the death-rate during 1905 was 14·2, compared with 19·2 during 1904.

Small-pox has been much less prevalent than for some time past; amongst Europeans, 41 cases were notified and 14 deaths registered; amongst Chinese, 246 deaths, as against 759 in 1904.

Cholera was unknown in Shanghai during 1905.

Typhoid fever attacked 50 Europeans, of whom 7 died. Dr. Stanley is of opinion that Malta fever occurs in Shanghai, in fact, in a recent letter to this Journal he substantiated the fact, and believes that several cases regarded as typhoid were really Malta fever infection.

Diphtheria.—Two deaths only occurred from diphtheria amongst Europeans although 22 persons were attacked. The reason for this low death-rate is no doubt due to the more general use of antitoxin, which is now produced in the Shanghai Health Laboratory.

Scarlet fever, a rare disease anywhere in Asia, except in Asia Minor, seems to have come to Shanghai to stay. Five cases were notified in 1905, in one of which the disease proved fatal.

Tuberculosis heads the list of fatal diseases, both among foreigners and natives, due to a great extent, no doubt, to overcrowding.

Plague cases were not met with in Shanghai during 1905.

Malaria of the benign tertian type occurred in Shanghai, but no deaths from the disease were reported. *Anopheles sinensis* is the variety of mosquito prevalent.

Dengue reached Shanghai in September of 1905, but the cases were neither numerous nor serious.

Beri-beri attacked 7 persons only, of whom 4 died. The municipal gaol was practically free from the disease during the year in question.

Dysentery caused but one death; there were three liver abscesses amongst Europeans.

The work at the Public Health Laboratory is evidently highly efficient, and the Health Department must be congratulated upon the extent and thoroughness of the work of sanitation which is rapidly bringing Shanghai to the forefront as a healthy place of residence for Europeans and for Chinese.

Reviews.

THE MEDICAL DISEASES OF EGYPT. By F. M. Sandwith, M.D., F.R.C.P. Part I. London: Henry Kimpton, 13, Furnival Street, Holborn, E.C., 1905. Pp. 316.

Dr. Sandwith has given us a book of a kind which is rare nowadays. It is written in a manner which

goes far to refute the accusation we are wont to hear frequently repeated, that medical literature in recent times has disassociated itself from all attempts at literary style. The whole book is interesting, and the matter is clothed in a manner at once fascinating and educative.

The opening chapter on "The Medical History in Egypt" shows a wealth of research and knowledge of which it is well known Dr. Sandwith is master. The chapter on Typhus reminds us that this disease still prevails in countries less favoured hygienically than our own. Where extreme poverty and ignorance of public hygiene obtain, there will typhus flourish, and until these are overcome typhus will continue.

Relapsing fever is traced historically, and at the present time when spirillar parasites are being discovered to be the cause of many ailments, it is well to have a description of its typical signs and symptoms.

Dr. Sandwith is of opinion that Egyptian town dwellers now suffer more from enteric fever than they did fifteen or twenty years ago. This is an experience in accordance with that of medical men in most tropical and sub-tropical countries. Whether this is due to more careful diagnosis, to Europeans carrying infection thither, or to an immunity acquired by natives in early years of life through having had the disease, is a matter of opinion at the present time.

Mediterranean Fever was not recognised in Egypt until 1883, when Dr. Sandwith recorded a case of the disease. Since then Mediterranean fever has been met with both amongst Europeans and natives.

Infectious Jaundice (Weil's disease) occurs as a rule only amongst the poorer classes of the community, but during epidemics of the disease any and every class are attacked. Dr. Sandwith is of opinion that the disease is carried by mosquitoes or other insects.

Scarlet fever is occasionally met with in Egypt, and measles is fairly prevalent.

Small-pox has committed fearful ravages in the Sudan during recent years, and in Lower Egypt during 1903 there were 2,118 cases reported, with 394 deaths from the disease.

Egypt is not free from an occasional outbreak of mumps.

Plague.—No mention of plague is contained in Egyptian papyri, but from the time of the third century B.C., the disease would appear to have recurred in Egypt at intervals, up to the present day.

Bilharziosis specially appertains to Egypt, for it was Dr. Bilharz, at Kasr-el-Ainy Hospital in Cairo, who first discovered the connection between hæmaturia and the Bilharzia parasite. The association between urinary calculi and this parasite, also first determined in Egypt, has revolutionised our idea of the pathology of these calculi.

A full description of Anchylostomiasis is welcome; and here, again, we have to thank an observer in Egypt, Dr. Looss, for his careful work on the subject, and for his brilliant observations on the mode of entrance of the larvæ of Anchylostoma by way of the skin.

The chapter on Pellagra closes the first volume, which is characterised by an accuracy of statement, a clearness of diction, and a knowledge of medical history as rare as it is pleasant to meet with.

THE BRITISH GUIANA MEDICAL ANNUAL FOR 1905. Edited by C. P. Kennard, M.D.Edin., M.R.C.S. Eng. Price 5s. Printed by "The Argosy" Company, Limited, Demerara.

We welcome this admirable medical annual, and congratulate the Editor and contributors upon the excellence of their volume.

CONTENTS.

(1) "Anchylostomiasis." By the Hon. J. E. Godfrey, M.B., C.M.Edin., Surgeon-General.

(2) "Preliminary Notes on the Mosquitoes of British Guiana." By the Rev. J. Aiken, M.A., and E. D. Rowland, M.B., C.M.Edin.

(3) "Report on Small-pox." By J. Teixeira, L.R.C.P. & S.Edin., L.F.P. & S.Glas.

(4) "Acute Anæmia." By C. P. Kennard, M.D. Edin., M.R.C.S.Eng.

(5) "The Criminal Insane and the Insane Criminal." By P. M. Earle, L.R.C.P. & S.Edin.

(6) "On Cataract Disease in British Guiana." By A. Wylie, M.A., M.B., B.C.Cantab., M.R.C.S., L.R.C.P.Lond.

(7) "The Value of Beta Naphthol in Treatment of Anchylostomiasis." By Q. B. De Freitas, M.R.C.S. Eng., L.R.C.P.Lond.

(8) "Typhoid Fever." By C. P. Kennard, M.D. Edin., M.R.C.S.Eng.

(9) "The Climate of Peter's Hall District and its Effects on the Inhabitants." By J. E. Ferguson, M.B., C.M.Edin.

PART II.—Clinical Notes. By Drs. Douglas, Wylie, De Freitas, Earle, Boase, Teixeira, and Kennard.

PART III.—Transactions of the British Guiana Branch of the Medical Association for 1904 and 1905.

Anchylostomiasis.

The measures by which the disease can be stamped out are stated by Dr Godfrey to be:—

(*a*) The diagnosis of every case.

(*b*) The treatment of every case.

(*c*) The destruction of fæces of persons known to be infected.

(*d*) The prevention of contamination of the land round and about the labourers' residences, and the fields in which they work.

(*e*) The prevention of contamination of the drinking water.

(*f*) The distribution of leaflets containing a simple narrative of the disease.

(*g*) Making it an offence for any person to defæcate on any part of the land except those portions set apart for the purpose.

Dr. Aiken, in his article, enumerates the British Guiana mosquitoes (from Theobald) as follows:—

Myzomia lutzii; Stethomyia nimba; Cellia argyrotarsis, sub-species, *C. albipes; Megarhinus hæmorrhoidalis, M. separatus; Janthinosoma musica, J. lutzii; Stegomyia fasciata, S. luciensis; Culex tæniorhynchus, C. serratus, C. confirmatus, C. nubilis C. scholasticus, C. flavipes, C. fatigans, C. serratus; Melanaconion atratus vel Culex atratus; Tæniorhynchus fulvus* or *Culex fulvus, T. confinnis, T. fasciolatus;*

Mansonia tittilans: Dinocerites cancer; Uranotænia pulcherrima; Ædeomyia squammipenna; Hæmagogus cyaneus, H. albomaculatus; Dendromyia ulocoma, D. asullepta, D. (quasi) luteoventralis; Runchomyia frontosa; Sabethes remipes; Sabethoides confusus; Goeldia fluviatilis.

PHTHISIS IN THE CITY OF CALCUTTA DURING THE YEAR 1905. T. Frederick Pearse, M.D., F.R.C.S.

By a more careful notification of the causes of death in Calcutta, Dr. Pearse has been enabled to come to more definite conclusions concerning the prevalence of phthisis in that city than has been hitherto possible. A paragraph from the report places the result of the investigation strikingly before us. "Perhaps the most striking feature shown by our investigations is the excessive prevalence of phthisis amongst females. Among males the death-rate was only 1·4 per 1,000, which is almost as low as the general rate for England (viz., 1·3 per 1,000), whilst amongst females the rate was more than double, viz., 2·86 per 1,000. Equally noticeable is the extreme prevalence of the disease amongst Mahommedan females, the rate for whom works out at no less than 4·6 per 1,000. In England the death-rate is higher among males than among females. Mahommedan males had an only slightly higher rate than Hindus. The high death-rate from phthisis in Calcutta is entirely due to the fatality of the disease amongst females. Mahommedans of both sexes, however, suffer more than Hindus."

New Instruments, &c.

MESSRS. MAYER AND MELTZER, 71, Great Portland Street, London, W., have sent us their catalogue of instruments used in the practice of laryngology, rhinology, and otology. The catalogue is a very complete one, and shows the careful attention Messrs. Mayer and Meltzer have paid to this branch of surgical appliances. Accompanying the catalogue is a handsome extract from "hospital work in London," with illustrations showing the work rooms of the firm and their general hospital fittings.

Notes and News.

RATS AND PLAGUE.—At a meeting of the Lahore Plague Managing Committee it was resolved that an epitomised copy in pamphlet form of the article in the *Civil and Military Gazette* of March 24th regarding the transmission of plague by the rat-flea be printed and distributed through the medium of the various plague sub-committees.

WE are glad to know that the proposed South African Medical Association is likely to prove a success.

LIEUTENANT-COLONEL GILES asks us to inform his correspondents who may be sending him entomological material, that his address has been changed to 3, Elliott Terrace, The Hoe, Plymouth.

Personal Notes.

India Office: Arrivals in London of Indian Medical Officers.—Major J. Chaytor White, Captain W. H. Henrich, Major R. G. Turner, Lieutenant-Colonel O. H. Channer, Captain G. O. T. Groube, Lieutenant-Colonel C. J. Parkies, Captain J. D. Graham.

Promotions:

The following Promotions are made in the Indian Medical Service.—Majors P. Hehir, L. J. Pisani, W. R. Edwards, C. MacTaggart, G. I. H. Bell, I. Daly, H. Fookes, E. Hudson, A. W. Dawson, and W. H. Robson to be Lieutenant-Colonels; and Captains G. Lamb, H. Burden, C. H. Bowle-Evans, I. Fisher, E. S. Peek, S. A. Harris, E. C. Macleod, C. Thomson, D. W. Sutherland, and W. Selby, to be Majors.

Leave.

Major G. T. Birdwood, 2 m. 12 d.
Major W. D. Sutherland, 15 m. combined leave.

Postings.

Captain H. G. Walton, from Sitapur to Agra.
Captain J. Stephenson to be Civil Surgeon, Shahpur.
Captain D. H. F. Cowen to be Civil Surgeon, Murree.
Captain L. B. Scott officiates as Civil Surgeon, Cachar.
Captain P. F. Chapman, from Civil Surgeon Chihindwara to Akola.

Geographical Distribution of Disease.

As information arrives we publish, under this heading, the principal diseases met with in tropical and sub-tropical countries, so that those interested in the Geographical Distribution of disease may have a means of gathering information concerning the prevalent ailments in different parts of the world.

Philippines.

Cholera.—Manila has been free from cholera since February 21st. During the present outbreak, which commenced on August 23rd, 1905, there have been 282 cases of cholera with 250 deaths from the disease in the city of Manila. In the provinces there were 3,742 cases of cholera reported, with 2,807 deaths.

Leprosy.—Two cases of leprosy, which were treated with the X-rays, and in which the symptoms disappeared for a considerable time, have proved disappointing, a relapse having occurred in both cases.

Small-pox.—The provinces of the Philippines, in which vaccination was thoroughly carried out, have remained almost free of small-pox, but in unvaccinated districts the disease has prevailed extensively lately.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

TSETSE-FLIES AND TRYPANOSOMES.

Minchin, Prof. E. A., who, it may be remembered, was deputed to Uganda by the Royal Society to study the relations between *Trypanosoma gambiense* and *Glossina palpalis*, gives, in his pamphlet of eight pages, the results he has obtained at Entebbe, in association with Lieutenants Gray and Tulloch, R.A.M.C. Previously to his joining them, these two officers believed they had discovered evolutionary forms of the *T. gambiense* in the flies.

Minchin's results are, however, somewhat disappointing, as he believes the forms they observed have no connection with the trypanosome.

Some 8 per cent. of the tsetse-flies found in the small island of Kimmi were infected with these supposed evolutionary forms, two distinct species, one resembling the trypanosomes of birds and the other that of mammals, being distinguishable; but no corresponding vertebrate host could be discovered, and inoculation of animals capable of harbouring *T. gambiense* gave negative results. On this account it appears more probable that these forms, which are of the *Herpetomonas* type, are really special parasites of the tsetse-flies, like the herpetomonads of ordinary flies which do not suck blood.

Some were also found in a *Glossina* born in the laboratory, and which had been fed only on the blood of a domestic fowl, so that it seems probable that these herpetomonads can be transmitted by hereditary infection.

Attempts to infect flies by causing them to bite infected animals gave doubtful results. Changes resulting in the differentiation of what seemed to be male and female types went on for forty-eight hours, but then the process came to an abrupt halt, and by the end of seventy-two hours few or no trypanosomes remained in the stomach or demonstrable by dissection, though it is possible that sectionising may yield different results. We are therefore still without any proof of the existence of any developmental cycle within the tsetse at all comparable with that of the malarial parasite in the mosquito. If any such cycle take place, it is presumable that the infection of the fly would require a certain interval for development after feeding with infected blood, but no such periodicity can be shown to exist. The *Glossina* can, however, undoubtedly act as a simple vehicle. Thus experimenting with rats seriously infected with a trypanosome (probably *T. Brucei*) by causing flies fed on them to bite healthy animals, four successes were obtained out of five experiments, while using *Stomoxys* only one success in four resulted. It is further noteworthy that while the trypanosomes survive seventy-two hours in *Glossina*, they persist but twenty-four hours in *Stomoxys*.

Prof. Minchin therefore inclines to the belief that the tsetse acts simply as a vehicle, and points out that if it really played the part of an intermediate host, the spread of the disease in human beings would probably be far more rapid than it is.

"Zeits. f. Hygiene," T. lii., p. 31, with 2 plates.

THE PATHOLOGICAL HISTOLOGY OF EXPERIMENTAL NAGANA.

Sauerbeck, Ernst. The author compares the pathological histology of trypanosomiasis with that of tropical splenomegaly from the *Piroplasma Donovani*. He examined the organs of rats, guinea-pigs, rabbits and dogs infected with *Trypanosoma Brucei*, but found nothing to add to the results of previous investigators. In the blood no degenerative processes are normally observable in the trypanosomes, but such are commonly to be found in the internal organs, notably in the spleen, lymph glands, bone-marrow, and liver, and less markedly so in the lungs.

The author regards the amœboid and other forms described by Plimmer and Bradford, and which they considered as stages in a complicated system of evolution of the parasite, as merely of the degenerative character, and further points out their close resemblance to the Leishman-Donovan bodies. Prof. Mesnil, commenting on the paper in the *Bulletin of the Pasteur Institute*, however, points out that though the resemblance between the two forms is undeniable, it cannot warrant our regarding tropical splenomegaly and trypanosomiasis as belonging to the same category of disease. The Leishman-Donovan bodies are a normal and definitive form for the human organism, and, despite the fact that cultivations of the *P. Donovani* give rise to flagellate forms, never include any trace of flagellate forms *in vivo*. The smaller bodies found in trypanosomiasis, on the other hand, are no part of the evolution of the parasites, but are merely stages of their degeneration, which rapidly disintegrate, while the Leishman-Donovan bodies maintain a perfect integrity. The involution forms of the trypanosomes are usually intracellular, and in course of digestion by phagocytes and Sauerbeck's own descriptions clearly show that the histological changes in the organs are due to proliferation of the latter, but he nevertheless insists on the complete resemblance between these histological elements and those found in tropical splenomegaly.

The phagocytic action of the mononuclear cells can be demonstrated by making an intraperitoneal injection of trypanosomes. The macrophages engulf the perfectly mobile parasites, which take a rounded form in their interior, and the same process evidently occurs in phagocytic organs, which behave in this case exactly as they do in malignant carbuncle, typhoid fever, or plague.

"Atti della Societa per gli Studi della Malaria," T.vi., Rome, 1905, 666 pages.

The volume is made up of the reports for 1904 of a number of writers who for the most part concern themselves with the results of preventive measures for malaria.

On the railways protection by metallic gauze for employees continues to be favourably reported upon, but it is pointed out by V. Polettina that for private individuals the expense is prohibitive, except in the case of the well-to-do. This contributor also considers that the dangers of rice cultivation are exaggerated, but it is obvious that this opinion may be based on local peculiarities of the district under his observation.

A large portion of the volume is occupied with reports on the results of the prophylactic administration of quinine, and the opinions of the various writers appear to be uniformly favourable. In many cases the sickness among the unprotected was three times as great as among those taking quinine, and in view of the large numbers treated, many of whom must have occasionally forgotten to take their dose, this must be considered highly satisfactory.

The annual cost per head, according to G. Soliani, is about 2.20 lire, or 1s. 10d.

The year's results are summed up by Prof. Celli in an able article. Judged by effects on the general population, the year 1904 was a bad one. In the north, benign tertian predominated, but in the south the Roman Campagna malignant tertian was commonest. Cases of quartan fever where irregularly distributed. In an epidemic, cases of relapse are always more numerous than those of primary infection. In the Roman hospitals cases of relapse were very common in July and August, and diminished suddenly in September, whereas usually relapses are most common in September and October. Primary infections were most numerous in July and August.

Although many contributors witness to the efficacy of Koch's method of large doses every eight or nine days, Prof. Celli appears to give his verdict in favour of the daily administration of moderate doses of 6 or 8 grains.

Notices to Correspondents.

1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the JOURNAL OF TROPICAL MEDICINE should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communications.

A FURTHER REPORT ON MEASURES TAKEN IN 1901 TO ABOLISH MALARIA FROM KLANG AND PORT SWETTENHAM IN SELANGOR, FEDERATED MALAY STATES.

By E. A. O. Travers, M.R.C.S., L.R.C.P.,
State Surgeon, Selangor, and
Malcolm Watson, M.D., D.P.H.,
District Surgeon, Klang.

The measures taken to abolish malaria from Klang and Port Swettenham in 1901 and 1902 by the extermination of mosquitoes by means of extensive drainage and other operations tending to do away with their breeding grounds, have been fully reported on in the Journal of Tropical Medicine of September 15th, November 10th, and December 1st, 1903, and April 1st, 1904.

It is proposed in the present article to show that the expenditure undertaken by Government, with a view to improving the health of the inhabitants of these towns, has been fully justified by the results which the experience of the last four years justifies us in concluding will be of a permanent nature.

For the information of those who have not read the previous articles on this subject, a brief account of the works carried out may be of interest.

Port Swettenham.—An area of about 110 acres, formerly low-lying, swampy land covered with mangrove trees, has been cleared and carefully drained. In the neighbourhood of the railway, Government buildings, and town site, a considerable area has been filled in and levelled, partly to do away with the breeding grounds of mosquitoes and partly to provide building sites. The whole area not occupied by buildings or roads is now covered by grass.

The total expenditure on works other than the preparation of building sites has been (to the end of 1905) £7,000, and the annual cost of upkeep of drains, &c., is approximately £40, for clearing earth drains and for town gardeners, £100.

Klang.—The area affected by the operations is about 332 acres. Twenty-five acres of virgin jungle and 80 acres of dense secondary growth (in places 30 to 40 feet high) have been cleared and 36 acres of permanent swamp have been drained. The areas cleared are now mainly under grass.

The total expenditure to end of 1905 has been £3,100, and the cost of annual upkeep is about £60 for clearing earth drains, and £210 for town gardeners.

As will be seen by the following statistics of cases of malaria treated at the District Hospital, Klang, the improvement in the health of the inhabitants of the areas treated began immediately after the completion of the drainage and other works, and has continued to date.

Table showing the number of cases of malaria admitted to the Klang Hospital from Klang Town and Port Swettenham, as compared to the number of cases admitted from other parts of the district :—

Residence	1901	1902	1903	1904	1905
Klang	334	129	48	28	12
*Klang and Port Swettenham	88				
Port Swettenham	188	70	21	4	11
Other parts of District ..	197	204	150	266	353
Total	807	403	219	298	376

* Certain persons lived some nights in Klang and some in Port Swettenham.

The following table shows the number of deaths from fever and other diseases which have occurred at Klang and Port Swettenham during the last six years. The population in 1901 was about 4,000, but has largely increased since.

Deaths in Klang and Port Swettenham corrected for Deaths in Hospital.

Year	1900	1901	1902	1903	1904	1905
Fever..	259	368	59	46	48	45
Other Diseases ..	215	214	85	69	74	68
Total	474	582	144	115	122	113

It will be noted that the remarkable improvement in the health of the inhabitants which occurred in 1902, immediately after the anti-malarial works had been completed, has been well maintained.

The following table shows the number of deaths occurring in the district of Klang, excluding the town of Klang and Port Swettenham. (Population 14,000 in 1901, since largely increased.)

Deaths in Klang District, excluding Klang Town and Port Swettenham.

Year	1900	1901	1902	1903	1904	1905
Fever..	173	266	227	230	286	351
Other Diseases ..	133	150	176	198	204	271
Total	306	416	403	428	490	612

These figures are especially valuable as a proof that the marked improvement in the health of the inhabitants of the town of Klang and Port Swettenham is due to the anti-malarial measures carried out, and not to a general improvement in the health of the district.

In Klang and Port Swettenham we have 368 deaths due to fever in 1901, and 45 only in 1905; whereas in the rest of the district, which has not been dealt with by any special anti-malarial works, we have 266 deaths due to fever in 1901, and 351 in 1905.

It may here be mentioned that Klang is a large planting district about 380 square miles in extent, that it is mainly low-lying flat land utilised for the cultivation of rubber, and that it would be almost impossible to protect the scattered population from malaria by

drainage and filling in swamps. A great deal is now being done on most of the estates by regular administration of quinine, and also by protection from mosquitoes.

Malaria in children as evidenced by Examination of blood.—No better indication of the presence or absence of malaria in any given district can be obtained than by a systematic examination of the blood of children.

The following details of the results of examinations carried out by Dr. Watson in 1904 and 1905 are of considerable interest :—

Results of Examination of Blood of Children in Klang and Port Swettenham (specially Drained Areas).

	Nov. and Dec., 1904			Nov. and Dec., 1905		
	No. Examined	Infected	Percentage Infected	No. Examined	Infected	Percentage Infected
Klang..	173	1	0·57	119	1	0·84
Port Swettenham ..	87	1	1·14	76	0	0·00
Total	260	2	0·76	195	1	0·51

Results of Blood Examinations in other Parts of District not especially Drained.

Nov. and Dec., 1904			Nov. and Dec., 1905		
No. Examined	Infected	Percentage Infected	No. Examined	Infected	Percentage Infected
298	101	33·89	247	59	23·8

Improvement in Health of Government Employées.—The remarkable way in which the health of the Government employées residing at Klang and Port Swettenham has been affected is well shown by the following figures. It may be mentioned that in 1901 the number of persons residing at Port Swettenham, employed by Government, was 176, and in 1904, 281.

Table showing Number of Sick Certificates and Number of Days' Leave Granted on account of Malaria.

	1901	1902	1903	1904	1905
Certificates	236	40	23	14	4
Days of Leave	1,026	198	73	71	30

The conclusions to be arrived at from the figures given in this report are very evident :—

(1) Measures taken systematically to destroy the breeding place of mosquitoes in the towns, the inhabitants of which suffered terribly from malaria, were followed almost immediately by a general improvement in health and decrease in death-rate.

(2) That this was due directly to the works carried out, and not to a general dying out of malaria in the district, is clearly shown by figures pointing out that while malaria has practically ceased to exist in the areas treated, it has actually increased to a considerable extent in other parts of the district where anti-malarial measures have not been undertaken.

The fact that the statistics for 1905 are even more favourable than those for 1902 is very strong evidence in favour of the permanent nature of the improvement carried out.

If, as it is hoped, malaria has been permanently stamped out from Klang and Port Swettenham by works undertaken in 1901, our experience in the Malay States should be of value to those responsible for the health of communities similarly situated in many other parts of the world.

THE ANATOMY OF THE BITING FLIES OF THE GENERA *STOMOXYS* AND *GLOSSINA*.

By Lieut.-Colonel G. M. Giles, I.M.S. (Rtd.).

(*Continued from p.* 185.)

The abdomen is a good deal shorter than the wings, and, seen from above, appears to be composed of only four segments, the juncture between the first two being hidden and the remaining four concealed by being curled under in the male or hidden in the telescoped ovipositor of the female. In the gorged insect, the whole of the ventro-anterior portion of the cavity is taken up with the enormous crop, which in males, when distended, occupies almost the entire space, leaving the other viscera crowded into a comparatively small space behind and above it. When empty of food it contains a certain amount of air, and Lieut. Tulloch's account, transcribed below, must be taken as referring to it in this condition : As his admirable account, which entirely agrees with my own observations, is very brief and to the purpose, I cannot do better than transcribe it, altering the nomenclature, where necessary, to that hitherto employed. He says :—

"The midgut runs down into the abdomen of the fly as a narrow tube of uniform diameter until it reaches nearly to the posterior border of the crop. At this point it dilates to several times its former diameter, its wall at the same time becoming thinner. It is proportionately shorter, less coiled, and more distensible than in *Glossina*, being about three times as long as the fly itself. This dilated portion has three simple coils, which lie superposed in the middle of the abdomen, and it then gradually narrows, continuing as a uniformly narrow tube down to the rectum. The narrow lower intestine has variable bends, but is not coiled. The rectum is a dilated cone-shaped cavity, with its apex towards the anus. Its walls are transparent, and through them are seen the four trumpet-shaped rectal papillæ, the narrow ends of which are pointed towards the anus, a single trachea entering the base of each. Below the dilatation, the rectum is continued to the anus as a short, narrow tube. In the female the distal part of the rectum runs within the ovipositor, the anus opening between the last segment of the ovipositor and the terminal plate. In the male the ejaculatory duct passes over it dorsally from left to right and runs anteriorly to enter the penis. The appendages of the alimentary canal are the Malpighian tubes, the crop and the salivary glands. The Malpighian tubes arise from a

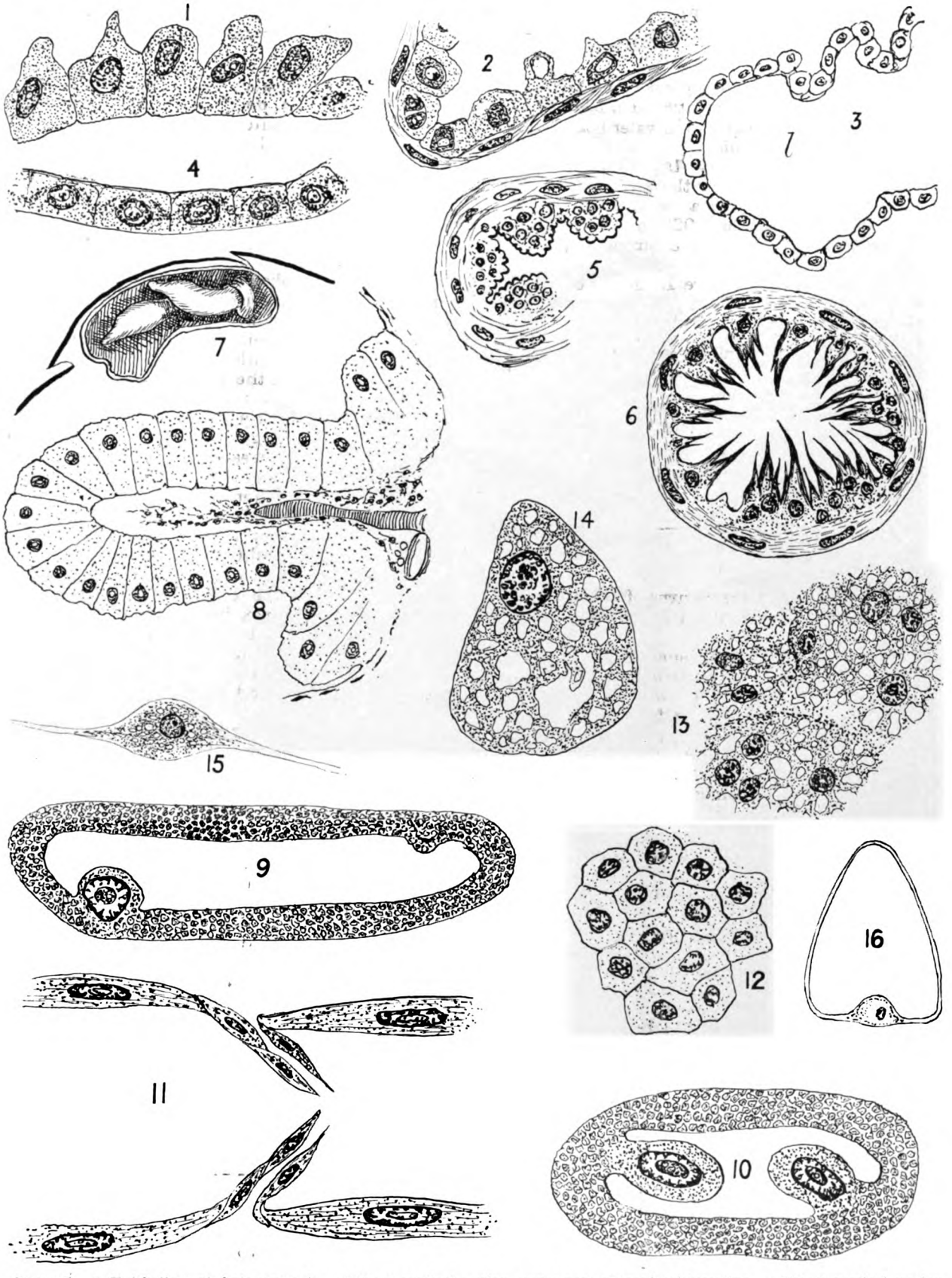
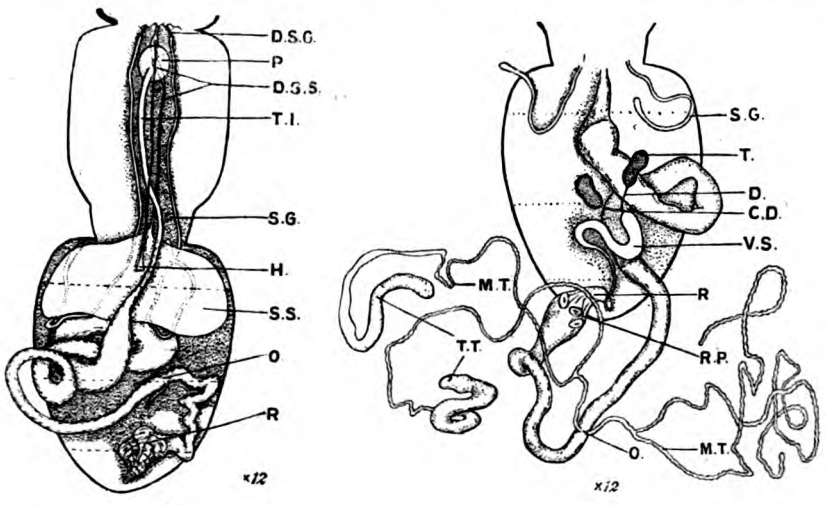


PLATE I.—1, Epithelium of chyle stomach, × 750; 2, vertical section, upper part of proximal intestine, × 750; 3, vertical section, lower thin part of proximal intestine, × 270; *l*, lumen of intestine; 4, the same, × 750; 5, vertical section, upper part of metenteron, × 270; 6, vertical section, lower part of metenteron, × 270; 7, drawing in perspective of rectal papillæ as seen in a dissection of the rectum which is laid open, × 37; 8, vertical section of a rectal papilla, × 270; 9, transverse section of heart of Stomoxys, × 270; 10, tranverse section of heart of Glossina, × 270; 11, semi-diagrammatic representation of valves of heart of Stomoxys, × 270; 12, pavement endothelium of pericardial septum, × 270; 13, portion of fat-body, × 550; 14, "pericardial cell" fat-body type, × 750; 15, pericardial cell, Lowne's muscular type, × 750; 16, transverse section, thoracic aorta, × 1,500.

To illustrate article by Lieut.-Col. G. M. GILES, I.M.S., "The Anatomy of the Biting Flies of the Genera *Stomoxys* and *Glossina*."

shallow constriction which marks the point of junction between the midgut and metenteron, and it, together with the true proctodeum, comprises in length about one fifth of the abdominal intestinal canal. Two of the tubules arise on either side from a short, common tube, all four being about the same length. The two arising from one side have thickened terminations, some four times greater than a



1. 2.

FIG. 29.—Dissections of the abdomen of *Stomoxys*, after Lieut. Tulloch, seen from above :—(1) with the parts almost *in situ*; (2) with the alimentary canal unravelled; CD, common seminal duct; D, seminal duct; DSG, duct of salivary gland; DSS, crop duct; H, dorsal vessel; MT, malpighian tubes; O, junction of distal intestine and metenteron; P, proventriculus; R, rectum; RP, rectal papillæ; SG, salivary glands; SS, crop; TI, chyle duct; *tt*, dilated ends of left malpighian tubes; VS, vesicular seminalis.

salivary gland, and lie in the pericardial sinus; those of the other are of uniform thickness, and end amid the fat body of the lower abdomen. The salivary glands in the abdomen are ventral to the crop, and seen from above only a knuckle of each projects beyond it, and then turned forwards to end close to the waist in slightly bulbous ends. Except for this angular bend the glands are straight, and even if extended, would not reach to the end of the fly.

Throughout its length the mucosa of the intestinal canal is composed of a single layer of epithelial cells. The wide thoracic portion of the midgut of the blow-fly, called by Lowne the chyle stomach, is in *Stomoxys* a quite narrow tube, though it has the same structure as in the former insect. Both it and the wide proximal intestine is composed of a layer of cells whose components vary a good deal in size and form, according to the stage of secretory activity in which they have been fixed. In the thoracic portion the muscular coat is fairly distinct, and both the longitudinal and circular fibres are arranged at intervals, leaving spaces where there is only epithelium; but the pouching out of the lining into these spaces is by no means as marked as in the blow-fly, so that even in proportion to its size this part of the gut has not as strongly granular an appearance when viewed with a dissecting lens. The dilated part of the proximal intestine has an epithelial lining (plate i., fig. 1) of much the same character, and both in it and the narrow transparent part that follows it the muscular coat is very ill marked, and often appears quite absent in sections; though where the transition to the structure of the narrow part occurs, the circular coat becomes very distinct (fig. 2). The narrow part is lined with cubical cells of regular form (figs. 3 and 4), and has a very distinct limiting membrane towards the lumen of the tube.

The metenteron, on the other hand, is strongly muscular, and is structurally divisible into two distinct portions. For the first and greater part of its length it is lined with a distinct cuticular lining, the epithelial elements of which are scarcely discernible. In the ordinary contracted condition of the tube, this is wrinkled into deep folds, in the interior of which are strong longitudinal muscular bands (pl. i., fig. 5), and outside these is an equally strong coat of circular muscular fibres. The last short portion before the rectal valve is of similar structure, but here (fig. 6) the cuticular lining has become distinctly chitinous, and has developed into a curious armature of powerful spines, the function of which I am unable to conjecture. There is, however, nothing generically peculiar in this structure, which is, I believe, found throughout the Muscidæ. The "rectal valve" between this portion of the intestine and the rectum is lined with similar spines, and is surrounded by a muscular thickening. At first the rectum is tubular, and its chitinous lining has a distinct basis of cubical epithelial elements; but after passing a quasi-sphincter formed by a thickening of the muscular coat, it expands into a large cavity which lies on the right side just under the interior abdominal terga. This dilated portion of the rectum is lined by a delicate chitinous membrane, the epithelial basis of which is not easily demonstrable, and is covered with a network of muscular fibres closer meshed, but of the same general character as that of the crop. This dilatation contains the four rectal papillæ, which are four cylindrical projections ending in blunt conical points, lying two and two lengthwise in the intestine. They resemble a good deal the rectal gills of certain aquatic larvæ, but according to Lowne subserve the renal function, as he has found in them a substance related to uric acid. Their general form may be seen from the dissection (plate i., fig. 7) of the two right-hand papillæ (the figure being reversed), and in section (plate i., fig. 8) are seen to be formed of very large columnar cells surrounding a core of delicate mesodermic tissue in which is imbedded a large trachea. Behind the papillæ the rectum contracts to a mere slit, and the absolute anus is guarded by a strong sphincter of unstriped muscle.

The malpighian tubes which enter the bowel at the point of junction of the proximal intestine with the metenteron hardly differ from those of the mosquito even in size. Their large pigmented cells and slit-like lumen, zig-zag longitudinally, must be familiar to most students of tropical medicine from their dissections of those insects. Lowne advances strong reasons for believing that

their function is hepatic, and not, as usually supposed, renal.

The crop has an elastic pigmented chitinous membrane covered with an open and rather irregular network of unstriped muscle, and its ventral side is connected with the abdominal sterna by a number of single obliquely-directed striped muscular fibres. Its whole structure is such that though clearly contractile, it is obviously absolutely incapable of active dilatation, so the name of "sucking stomach," which is sometimes applied to it, should be carefully avoided.

In *Glossina* the abdominal intestine is longer, larger, and in every way more voluminous, and the secretory area of the dilated portion has its surface enormously increased by deep infoldings of very large epithelial

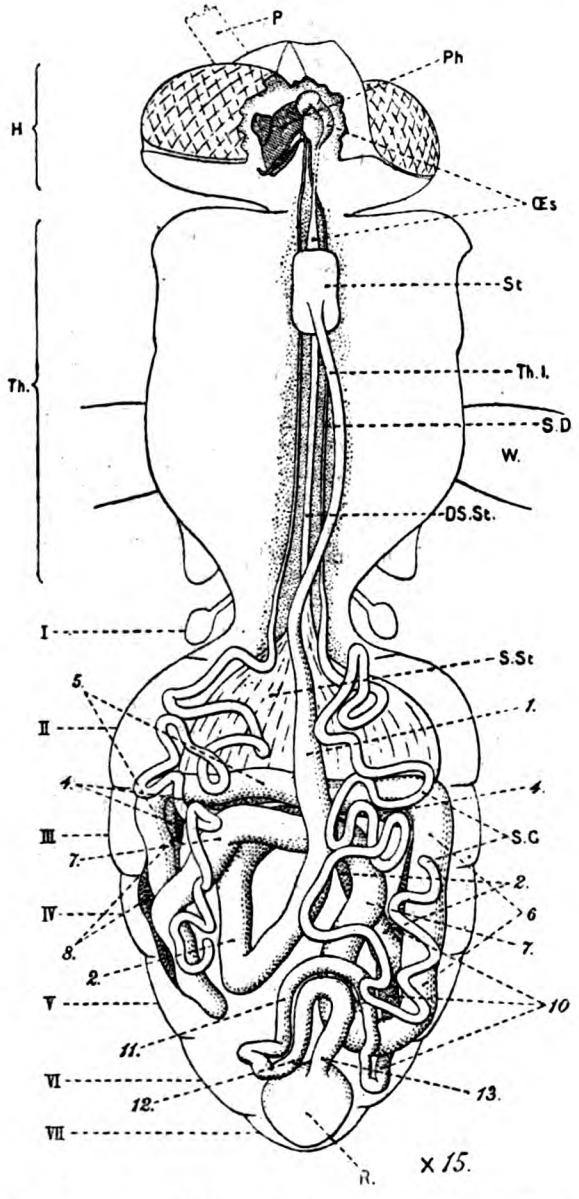


FIG. 30.—General view of the digestive tract of Glossina palpalis, as seen in dorsal view without disturbing its parts. The heart and over-lying tracheæ and fat-body are removed in the abdomen, also the muscles in the thorax, and the brain and other parts of the nervous system are omitted from the drawing. The head is turned round to the left, in order to show the pharynx, &c., in three-quarter side view. *Ph*, pharynx; *Œs*, œsophagus (the portion which passes through the brain being represented with a dotted outline); *St*, stomach; *Th*, *I*, thoracic intestine, pulled over to the right, in order to show the duct of the crop lying beneath it; *S*, *D*, salivary duct; *DS*. *St*, duct of; *S*, *St*, the sucking stomach; *S*, *G*, salivary gland (that on the right is drawn from a specimen in which the gland was more developed than in the case of that drawn on the left); 1 13, limbs of the abdominal intestine (see fig. 31); *R*, rectum. (After Minchin.)

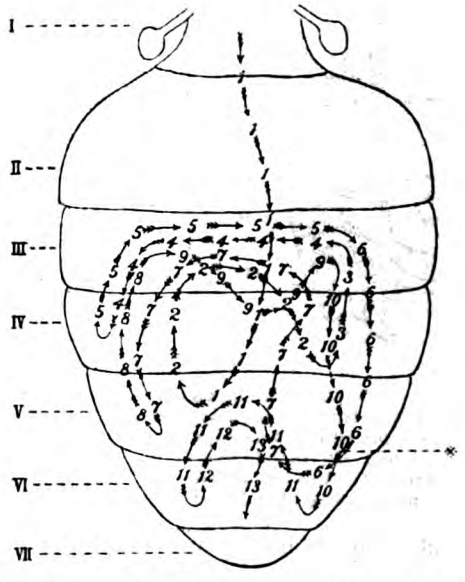


FIG. 31.—Diagram to show the various limbs (1—13) of the abdominal intestine, and their arrangement in the abdomen. The asterisk * denotes the point at which the Malpighian tubules arise in the tenth limb. (After Minchin.)

elements. The two figures herewith reproduced from Professor Minchin's paper will, in the light of what has been said of the allied species, give a sufficient idea of the arrangement of the parts, and as he proposes to write a paper on the histology of the genus, any further discussion of the subject here is superfluous.

The enormous development of the intestine is somewhat surprising in a species subsisting on so nutritious a diet as blood.

The vascular system.—What is found by the writer the readiest plan of demonstrating the dorsal vessel of a dipterous insect is to compress the insect between the fingers and thumb, at the same time, as far as possible, strengthening out the dorsal curve, and then to snip off the mid-dorsal portion of the abdomen by a single stroke of a pair of sharp scissors.

The portion removed is then placed in water, under the dissecting microscope, and as much as possible of the fat body picked away. The facility of this latter operation, however, differs greatly in different species, but is especially difficult in *Stomoxys*. Lieut. Tulloch, in his paper, notices this point. He says:—

"Though several stained preparations were made, it was impossible, owing to the fat body, which obscured all detail, to count the chambers and cells in the heart wall. They seemed, from a comparison of all preparations, to be re-

duced in proportion to the smaller number (four) of abdominal segments possessed by *Stomoxys*."

As compared with *Glossina*, I am inclined to agree with Lieut. Tulloch as to the number of chambers, but must confess great uncertainty on the point.

Referring to *Glossina*, Prof. Minchin writes as follows :—

"The vascular system consists of the heart, in the abdomen, and its continuation, the thoracic aorta, in the thorax.

"The heart occupies the five anterior segments of the abdomen, and is situated dorsally immediately below the plates of the terga. It is so imbedded in the fat body and pericardial tissue that not much can be made out of its structure by dissection alone, and examination of it mounted as a preparation for the microscope is necessary. It can then be seen to have five chambers, each with a pair of ostia and a pair of alary muscles, corresponding to the segments in which it lies. The alary muscles pass out at right angles to the axis of the heart, and can be traced through the fat body to their attachments at the external lateral margins of the tergal plates.

"The hindermost chamber of the heart appears to end blindly posteriorly. A little way in front of the hinder end are attached the two large alary muscles, the largest of the whole series; not far in front of these again are the two ostia, on the sides of the widest part of the chamber. In front of the ostia the lumen of the heart narrows rapidly, and to the narrow portion is attached the next pair of alary muscles, lying in the hinder part of segment 4. This arrangement is continued in segments 2, 3, and 4, the dilated portion of the chamber, with the ostia, occupying the middle of the segment, while the alary muscles, attached to the constrictions between the chambers, lie in the posterior regions of the segments. The alary muscles of these three segments are of moderate size. In segment 2 the heart receives a pair of tracheal tubes, right and left, which come to it opposite the ostia, and fork at once into branches running forwards and backwards. The alary muscles corresponding to the first abdominal segment are very small and difficult to make out, and the region of the heart to which they are attached does not show the slightest diminution or constriction of its lumen, as is the case in all the chambers posterior to it. In front of the first pair of alary muscles, at the usual interval, are the two ostia, quite similar to those of the other chambers. In front of the first pair of ostia the lumen of the heart narrows to form a thin-walled vessel, which passes through the waist to become the artery which I have termed above the thoracic aorta. This last runs along the thoracic intestine on its dorsal side, and is continued over the stomach, remaining apparently quite independent of the digestive tract, and only loosely attached to it, until it reaches the œsophagus. Here it is firmly attached and becomes considerably dilated. A short distance in front of the stomach a conspicuous cushion-like mass of large cells lies over the aorta. At first I took this structure for a ganglion, but it appears to be a sort of lymphatic gland, judging from its appearance in sections. The thoracic aorta is apparently continued through the neck into the head, but I have not been able to follow its course further than the thorax.

"The microscopic examination of the heart shows further that its floor is composed chiefly of fusiform cells resembling unstriped muscle fibres, while its sides are made up of gigantic cells with nuclei of corresponding proportions. These cells are arranged with perfect regularity, and in a manner exactly similar on the two sides of the heart. Each ostium is formed by two cells, which are of small size when compared with the huge cells building up the wall of the heart, but are very large when compared with the cells of the surrounding tissues. Two of the giant cells intervene on each side between the hinder end of the heart and the fifth pair of alary muscles; two more between these muscles and the ostia next in front of them; and so on with unfailing regularity all the length of the heart, each ostium being separated from the alary muscles next in front or behind by just two giant cells. In front of the first pair of ostia are found two cells of the usual size on each side, then a pair of slightly smaller cells, which pass on into the walls of the thoracic aorta. Thus the entire wall of the heart is built up of 23 pairs of giant cells, not counting the ten couples of smaller cells which compose the five pairs of ostia: to wit, four pairs to each of the five chambers, two additional pairs behind the fifth pair of alary muscles, and one pair anteriorly, making the transition to the thoracic aorta. In view of the fact that the thoracic vessel is itself to be considered as a modified anterior portion of the heart, it is interesting to find that its delicate wall contains very large, flattened nuclei, arranged in pairs right and left.

"The alary muscles consist of delicate fibrils, arranged in an irregular fan-like manner, uniting into a stout muscle-fibre which is distinctly striated."

The above description, in the main, applies equally well to *Stomoxys*, and is in entire agreement with such observations as I have made on *Glossina*, except as to the floor of the heart being composed of "fusiform cells resembling unstriped muscular fibres." It is believed that the statement is referable to the appearances presented by dissected specimens, which always include the pericardial septum, which, seen in optical section, certainly conveys the impression described. As the result of the examination of sections, the writer believes that Lowne is correct in describing the dorsal vessel of Diptera as a hollow muscle, composed at the most of two cells in any single transverse section.

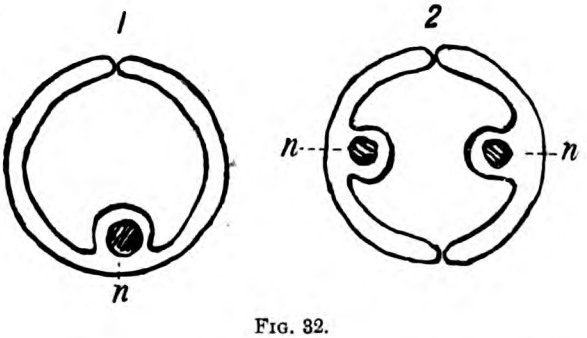


FIG. 32.

Lowne's conception of the heart of the blow-fly, as gathered from his book, may be diagrammatically represented as in fig. 32, each large nucleated cell being provided with lateral expansions which meet above in the middle line. In *Glossina*, however, my sections appear to show that there are always two cells in any individual transverse section; and that, as Professor Minchin states, they are symmetrically disposed in pairs, but I can find no difference in structure in the upper and lower walls, and so doubt the existence of a structurally differentiated floor to the organ.

In *Stomoxys* there are also usually two cells in any individual transverse section, but they are placed not opposite each other, but alternately, so that only one of the oblong nuclei is ever visible in a single section, and opposite the middle of each the entire circumference of the tube is presumably formed by that cell alone. The number of giant cells would therefore be less than in *Glossina*; but, like Lieut. Tulloch, I have been quite unable to count them, and the heart is so

frequently damaged in serial sections of the entire insect that they throw no further light on the point beyond the fact that the nuclei are certainly opposite in *Glossina* and alternate in *Stomoxys*.

Seen in transverse section, the entire wall of the heart has an uniform structure but for the nuclei of its component giant cells. On close examination the protoplasm is seen to be broken up into masses of irregular prismatic section which form the cross view of the longitudinal striation, which is distinctly visible in longitudinal optical section. Plate i., fig. 9, represents a section of the anterior part of the heart of *Stomoxys* (Banded form ♀) in which, on the right side of the figure, one of the nuclei of that side is cut across, while that of the opposite side is divided beyond the nucleus, and so represented only by a slight projection. In pl. i., fig. 10, is shown a similar section of the back part of the heart of *Glossina*, in which the nuclei of the two component cells are divided at about a corresponding level. It is noteworthy that in this insect the cells project much more into the lumen of the tube than in *Stomoxys*, so that at their thickest part they appear connected with the body of the cell by a comparatively narrow pedicle. Fig. 11 is a semi-diagrammatic representation of a valve in *Glossina* as seen in optical section. It will be noticed that it differs somewhat from Prof. Minchin's account of the number of component smaller cells, in that three instead of two are represented as forming the valve, but the appearances presented by a structure seen in this way are notoriously deceptive, and I have no disposition to press the point. In *Stomoxys* I have as yet failed to obtain any satisfactory view of the valves. (*To be continued.*)

Correspondence.

To the Editors of the JOURNAL OF TROPICAL MEDICINE.

DEAR SIRS,—The following case may be of some interest to younger members of the profession in the tropics. A blacksmith, S., aged 35, from Jerusalem, well-known as one of the strongest men in the place, consulted me three or four months since for abdominal pain. Nothing being much wrong with him I prescribed a purge with santoninum. Next day he came back much pleased with the relief he had experienced, but I could hardly understand why he was so pleased. However, next day his symptoms recurred, it being cold weather and no history of fever and chills being given, the idea of malaria never occurred to me.

Two days later I received an urgent message, and later an offer of double the usual fee if I would go at once to see him. He was doubled up with abdominal pain and had been very sick, but there was nothing in the abdomen to account for it. Finding he had a temperature of 103°, I took a slide of his blood, warning him that if the examination were negative he must go to hospital. The matter was cleared up, greatly to my surprise, by my finding numerous tertian parasites and gametes, and a few doses of quinine soon ended the attack; the spleen was not at all enlarged.

I am, &c.,
J. CROPPER.

Ramallah, Jerusalem.
June 13th, 1906.

To the Editors of the JOURNAL OF TROPICAL MEDICINE.

SIRS,—In the course of my work with films from yaws lesions and glands, I have been able to confirm some at least of the observations of Dr. McLennan (*British Medical Journal*, May 12th, 1906), connecting spir. pallida with cytorrhyctes luis.

The enclosed sketches were taken from a smear of serum of a cleaned frambœsia, stained in Giemsa solution. They show in the briefest way the almost certain identity of the organisms found in syphilis and yaws.

The study is a difficult one, especially for a medical officer "fed up" with work, and I have been handicapped by want of higher powers. The London School of Tropical Medicine lent me a $\frac{1}{18}$, but unfortunately they required it again before one had got well into the research.

I am now awaiting new lenses, and hope to be in a position to report progress later.

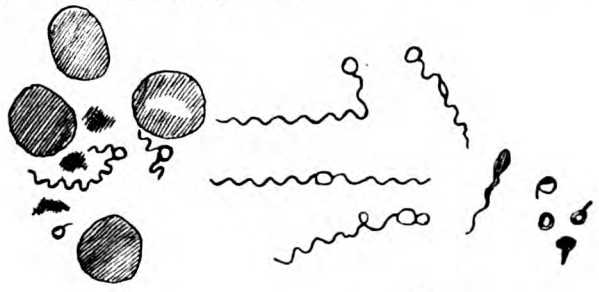


FIG. 1.
A group as actually seen.

FIG. 2.
Some forms occurring on same slide as fig. 1.

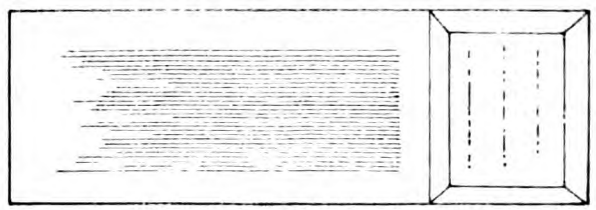
St. Vincent, B.W.I.
May 29th, 1906.

C. W. BRANCH, M.B.

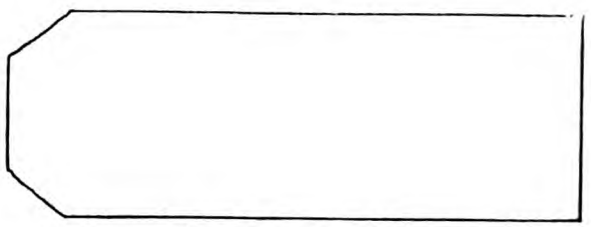
To the Editors of the JOURNAL OF TROPICAL MEDICINE.

DEAR SIRS,—I enclose a slide showing a method of preparing films of blood which I have found very useful in practice. It has the following advantages:—(1) Great simplicity. (2) The film can be made at any distance from the edge of the slide. (3) In an emergency the ear can be cut with the edge of the slide in the absence of knife or needle. An ordinary ground glass slide is clipped by scissors so that one end is narrowed to the desired width of the film, this varying according to the particular mechanical stage in use. The film is made in the ordinary way as described by Daniels, *i.e.*, with the end of the slide.

I am, &c.,
J. CROPPER, M.D.



Film made by slide below.



Slide cut to desired width.

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THE

Journal of Tropical Medicine

JULY 2, 1906.

HYGIENIC MEASURES AGAINST SYPHILIS.

HARBEN LECTURE No. III.

PROFESSOR METCHNIKOFF dealt with syphilis and its prophylaxis in manner at once practical and scientific. Syphilis, like tuberculosis and influenza, is directly contagious from man to man, requiring no intermediary host to transmit the infection. At first sight it would seem an easy problem to check the spread of a disease which is conveyed by intelligent human beings by appealing to their intelligence, compared with what would seem the unsurmountable difficulties of preventing the spread of disease by, say, irresponsible insects serving as intermediary hosts in such diseases as malaria, filaria, yellow fever, and others. Yet it is not so; animal pests can be destroyed, mosquitoes can be prevented breeding their kind, but appeal to man's intelligence is well nigh useless in conflict with the passion which determines the infection of syphilis. The disease is, as a rule, contracted by quite young men and women at an age before acquaintance with the world has enabled them to grasp, or it may be to have heard spoken of, the meaning of syphilitic infection or how it is conveyed.

In Western Europe one sees for the most part the individual attacked; in Russia the whole family may suffer. In remote villages the disease, once introduced, not infrequently spreads from child to mother, to grandparents, and to brothers and sisters by kissing the infant. After pointing out the destructive influence syphilis has upon the body tissues and upon duration of life, Professor Metchnikoff dealt with the prophylaxis of the disease. The proposal that young persons should be told the meaning and danger of promiscuous intercourse and the terrible effect of acquired syphilis was dismissed as impracticable, and as wholly inefficacious and undeterrent. Medical inspection of women likely to spread the disease is also an inefficient method, as much of the infection takes places amongst quite young girls before they become declared public prostitutes. Early marriages are not calculated to diminish the evil, owing to the extreme youthfulness of the great proportion of syphilitics, the disease being contracted before even the age at what may be called youthful marriages are wise or usual. Professor Metchnikoff then proceeded to show that the only prophylactic of practical value is the early application of mercury. By experiments on animals, and even on men, by several observers it has been shown that an inunction of metallic mercury, calomel, white precipitate, or salicyl-arsenite of mercury with lanolin of the strength of 1·3 or 1·4 gives satisfactory protective results. Inunction should be thorough, persisted in for four or five minutes, and applied between one and twenty hours after inoculation. The result of experiments is that mercurial ointments may certainly be useful prophylactics against syphilis in all those cases where a contact, however little suspicious, has taken place. Instead of blue ointment, which causes much irritation of the skin and mucous membranes, the use of salves made up with non-irritating mercury salts above mentioned, should be recommended.

Professor Metchnikoff dismisses the contention of persons who would punish sexual delinquents by allowing the disease to run its course as prudish, and sums up the matter by pointing out the effect of allowing the opinions of persons with such beliefs to be heard, in these words:—"Persons who look apon the prophylaxis of syphilis as immoral should apply the same reasoning to the use of antiseptics in midwifery, because it facilitates criminal abortion." Further, he states: "No considerations of a moralising tendency should be opposed to the prevention of so disastrous a calamity as syphilis. True morality ought rather to contribute as much as possible to the prophylaxis of this and many other diseases."

THE TRAINING OF THE INDIAN SUBORDINATE MEDICAL SERVICE.

SOME 250 students of the Punjab Medical College at Lahore recently waited on the Inspector for Civil Hospitals to represent certain grievances. They complain that certain of the native professors are arbitrary and abusive, and desire the right of direct appeal to the Principal. They also represent that their books and appliances are obsolete, and begged that the lectures should be delivered in English, as all have passed a sufficient test in English at the Entrance Examination.

The unanimity of the students in this case makes it probable that the above incident is no mere ebullition of the factiousness to which the native student is some-

times prone, more especially as there can be no doubt that they have grave and genuine grounds for their dissatisfaction. As to the merits of their complaints against their native lecturers we have no means of judging, and, in any case, they affect the qualifications of individuals only and not the general question of the system of management of the vernacular medical schools; but the plea of the students is really for European governance and teaching, and is a very remarkable instance of the genuine preference of the Indian for English rule. The young educated Indian is, very naturally, apt to inveigh against his rulers as invaders and oppressors, but where his personal interests are concerned he will generally be found to prefer English professors and judges to his own countrymen. Personally, we think this distrust is generally quite unmerited, but it is possible that the native best knows his own business, and there can be no doubt that in this particular case the students' strictures on the schools and their appliances are quite justifiable, and especially in the matter of available medical literature. The vernacular medical student is so poor that the publication of books to meet his requirements cannot possibly be expected to be a paying transaction, and hence most of those available are practically obsolete *rechauffés* of English text-books, designed to meet the requirements of European students of a past generation. It must be remembered that text-books intended for the use of candidates for full medical qualifications are quite unsuited for the purpose of the vernacular student, as they are over-laden with too much detail to be fitted for the use of men who have but a limited time at their disposal; and hence mere translations of even the best modern text-books, however faithful, will in no way meet the special requirements of the case. To be really suitable, special text-books must be compiled in a more or less "semi-popular" style, and but little writing of the sort has, as yet, been attempted.

As already indicated in our article on "The Problem of Medical Aid in Semi-civilized Countries," we should be the last to propose to convert our Hospital Assistant class into fully qualified practitioners, but are, nevertheless, convinced that such instruction as they are given should be the best available, and that greater ability is required of lecturers who have to teach men less educated than themselves, than of those who have to deal with their own intellectual equals.

Further, it can scarcely be denied that the "Vernacular Medical Schools" are conducted by the Indian Government in far too niggardly a spirit.

The only even nominal European official is the "Principal," but as this official, as Civil surgeon of a great city, has already a very fair job for any two ordinary men on his shoulders, the time he can possibly devote to the school must be so small as to make him little less than an ornamental figurehead.

Under these circumstances the Indian "Superintendents" must needs be the real rulers of the students, and the result must be that they have power without responsibility, while the Principal is responsible, without being able, for want of time, to exercise any real power. In view of the large number of students attending the classes, and the economic importance of the service to the Indian Empire, the mere description of the present plan of management is a sufficient condemnation. It must not be supposed that we are advocating the entire substitution of European for native lecturers, as these are already far too few to deal properly with the subjects taught; but the teaching staff should be strengthened by the addition of at least two European officers, who should give their entire time to the work, and should be men not too senior to be in recent touch with the latest developments of medical science, and not too junior to possess a thorough knowledge of the vernacular; for though many of the students are fair English scholars, it may be doubted if the majority have a sufficient knowledge of our language to benefit fully by instruction conveyed through it. In making such a recommendation we wish to convey no idea derogatory to the native lecturers, most of whom are able men and most capable practitioners; but they are necessarily rather senior men before their capabilities are discovered, and through no fault of their own, they have lacked all opportunity of post-graduate study, so that the adoption of our suggestion could hardly fail to revolutionise the rather obsolete methods of teaching now in use.

To obtain suitable text-books a substantial reward should be offered by Government for the copyright of the best work for the purpose in each subject in English dress, and the selected text-books should be translated into the vernaculars by a mixed staff of English and Indian medical men.

The schools, too, badly lack apparatus and appliances for illustrating teaching, and these should be supplied.

It can surely not be said that the reforms suggested are either sweeping or costly, and it can hardly be maintained that they would fail to enormously increase the efficiency of the vernacular schools, and the invaluable service which is trained therein. Meanwhile, however, we cannot but think that the students are perfectly justified in indulging in what our Indian medical contemporary elegantly denominates as "grousing."

SERUM-THERAPY OF PLAGUE IN INDIA.[1]

Lieut.-Colonel W. B. Bannerman, the Director, Plague Research Laboratory, Bombay, in his comprehensive and excellent introduction to the "Scientific Memoirs," No. 20, new series, dealing with serum-therapy of plague in India, states that "In view of the somewhat discouraging results obtained among hospital patients in India, it seems necessary to commence anew the study of the serum-therapy of plague."

Anyone who has carefully read the memoirs in question must agree with Lieut.-Colonel Bannerman. That there are indications that the treatment of plague by serum is a step in the right direction there can be no doubt; but that the various sera to hand are administered at times or in doses sufficient to cope with the malady is scarcely apparent.

Lustig's serum.—Haffkine, W. M., contributes a

[1] "Scientific Memoirs," by Officers of the Medical and Sanitary Departments of the Government of India. Calcutta, 1905. New Series, No. 20.

report on a series of 484 cases of plague treated with Lustig's anti-plague serum. The general result was as follows: Among the 484 cases treated with serum there were 55 fewer deaths than among the 484 control cases not treated with serum.

Terni's serum.—Haffkine, W. M., and Costello, C. T., report on 110 cases of plague treated with Terni's anti-plague serum. The general result was: 89 deaths among 110 cases treated with serum, compared with 90 deaths among 110 not treated with serum.

Brazil's serum.—Haffkine, W. M., and West, W. G., report on 70 cases of plague treated with Brazil's anti-plague serum. In the Modikhana Hospital amongst the serum-treated there were 17 deaths out of 20 cases (85 per cent. mortality), against 15 deaths out of 20 control cases not so treated (75 per cent. mortality). These figures show that fewer control cases died than when serum was given.

At the Maratha Hospital the serum-treated numbered 50, died 41 (82 per cent. mortality). Control cases numbered 50, died 45 (90 per cent. mortality).

Roux' serum.—West, W. G., reports on 68 cases treated by Roux' anti-plague serum. The serum treated cases showed a death-rate of 66·17 per cent.; the control cases a death-rate of 60·29 per cent, showing a difference in favour of the control cases of 5·86 per cent. The general drift of the evidence before us is, (1) that the initial effect of the introduction of any serum has the power in many instances of reducing the temperature, the pulse and the respirations. (2) That the favourable initial effect was not maintained. (3) Life would appear to be prolonged for an average of several hours. (4) Decided reduction of the mortality cannot be attributed to the treatment by serum.

DISTRIBUTION OF LIEGE EXHIBITION AWARDS.

The awards to the British Section of the recent Liége Exhibition were distributed on June 13th. The proceedings took place at the Mansion House, and the Lord Mayor, Alderman W. Vaughan-Morgan, occupied the chair.

Mr. Imre Kiralfy, the British Commissioner-General, read a report upon the exhibition, and the meeting was subsequently addressed by the Belgian Minister, Count de Ialiang, Sir Albert Rollitt, M. Edouard Seve, Sir William Holland, and the Lord Mayor. The diplomas were then presented by Count de Lalaing. A notable feature of the ceremony was the receipt by Burroughs, Wellcome and Co. of five awards of grand prix, three diplomas of honour, three gold medals and one silver medal.

"ATTI DELLA SOCIETA PER GLI STUDI DELLA MALARIA," ROME, 1904.

In this well-known yearly publication, A. Celli gives a masterly *resume* of the work on malaria accomplished in Italy during the year 1904. The epidemic of 1904 was, generally speaking, more serious than those of the preceding years. Benign tertian was predominant in the north of Italy, while in the Roman Compagna and the south of the peninsula the subtertian was the commonest form met with. According to Celli's observation in an epidemic of malaria, cases of relapse are more frequent than cases of primary infection; relapses were extremely common in the hospitals of Rome in 1904 during the months of July and August, suddenly decreasing during September, contrary to the experience of 1903, when relapses were most frequent in September and October. Primary infections were observed to be more common in July and August.

The relation between climatic factors and malaria remains obscure; in the year 1904 the end of the epidemic coincided with the end of the hot season. The economical conditions have a certain indirect influence on the prevalence of the disease; in the more prosperous provinces the use of quinine, as a preventive and curative agent, becomes more general and the cases of malaria decrease. The author gives the results obtained by the method of prophylaxis by quinine given daily in 5 to 8 grain doses. The prophylatic administration of quinine in such doses does not generally give rise to any untoward symptoms. In Celli's experience the daily administration of quinine in the doses mentioned is of greater efficacy than Koch's method of giving a large dose once in seven or ten days. The quinine prophylaxis was in 1904 applied to 52,690 persons, all of whom were much exposed to malarial infection; of these 4,262 got malarial attacks, that is to say, 8·08 per cent. in the year.

For the railway employés, the mechanical prophylaxis by means of wire, mosquito nets, &c., was used, with good results.

In addition to this most interesting report of Celli, the "Atti" contains numerous other memoirs on various subjects relating to malaria. B. Galli Valerio and Jeanne Roshag de Jongh describe their experiments on the biology of Culex and Anopheles.

Martinetti and Castellini publish the results they have obtained in their endeavour to produce a quinine compound devoid of bitter taste. Ed. and Et. Sergent report on the epidemiological studies undertaken by them in Algeria.

Other very interesting papers are by Gualdi, Casagrandi, Gaglio and Rossi, for which we refer the reader to the original publication.

Prof. Celli and the "Societa per gli studi della malaria," are to be congratulated for the splendid work accomplished in the fight against the disease which is the scourge of the Roman Compagna and of so many other parts of Italy.

LONDON SCHOOL OF TROPICAL MEDICINE.

Entertainment to the Hon. Bomanji Petit.

On June 11th the Hon. Bomanji Petit, of Bombay, to whom the London School of Tropical Medicine is so deeply indebted for a munificent donation to the funds of the Institution, was entertained at luncheon by the teaching staff and students of the School. Sir Francis Lovell the Dean of the School presided, and amongst those present were: Sir Patrick Manson, Dr. C. W. Daniels the Superintendent of the School, Dr. A. T. Stanton, the Students at the School, and Mr. P. Michelli the Secretary. A hearty welcome was

accorded to Mr. Petit, and the Dean, in proposing his health, referred to the many benefits Mr. Petit had conferred by his philanthropy on several public and scientific institutions in India, and to his generous contribution of a lac of rupees towards the funds of the London School of Tropical Medicine. By his generosity and timely help the School had been largely relieved of the heavy financial burden necessarily incurred at its foundation, and the example he had set had directly benefited the School by inducing others to contribute to this worthy institution, and so to promote the welfare of their fellow subjects in many parts of the Empire. In reference to the present position of the School, which owed its inception to the Right Hon. Joseph Chamberlain, Sir Francis stated that the teaching and appliances in the School were of the most modern character, that much remained to be done in the way of equipment of the museum and library, and in several other directions. Money is wanted for the endowment of lectureships and for research. Recently two new Chairs had been founded, one for the teaching of Protozoology and the other for Helminthology. The Colonial Office had generously helped to establish these lectureships, whereby the efficiency of the School would be greatly enhanced. The advance of tropical pathology had rendered these Chairs a necessity, and it was no less imperative that the subject of Entomology should be placed on a similar footing to Protozoology and Helminthology. When funds were available this would be done, and it was to be hoped that a generous donor would soon come forward to enable the School to attain this desirable object. Since 1899, when the School was opened, over 600 post-graduate students have passed through a course of instruction at the School. Sir Francis closed his remarks by stating the deep indebtedness of the School to the Hon. Bomanji Petit, and expressed the pleasure it had given the Seamen's Hospital Society and the London School of Tropical Medicine to be privileged to entertain Mr. Petit and the members of his family who accompanied him.

The Hon. Bomanji Petit, in his reply, testified to the satisfaction the establishment of the London School of Tropical Medicine had given in India. There were many diseases that required elucidation, but none more urgently than plague, which had caused widespread havoc in India for many years. The prevention of plague ought to be one of the foremost subjects to engage the attention of the teachers connected with the London School, for in India the people looked to the science and skill of western doctors to free them of the scourges which decimate their ranks and materially affected the progress of the country. Mr. Petit urged the members of the School to continue their good work, and to rest assured that India would not forget their labours in the cause of mankind.

We would direct special attention to the article by Dr. E. A. O. Travers and Malcolm Watson on the measures taken to abolish malaria from Klang and Port Swettenham. That these measures have been eminently successful is a matter for univeral satisfaction, and ought to stimulate similar efforts in every part of the tropics. We are glad to note that Major Ronald Ross, C.B,, F.R.S., has drawn attention to the results this article indicates in the *Times*, so that the valuable information may reach the ears of governors of colonies and others interested in the hygiene of tropical countries.

COLONIAL NURSING ASSOCIATION.

Annual Meeting.

Lord Elgin, Secretary of State for the Colonies, in addressing the Colonial Nursing Association at the Colonial Office on June 13th, congratulated the Association on the good work they had accomplished. It is now ten years ago since Mr. Chamberlain initiated the movement which resulted in the Association being founded. In many despatches to the Colonial Office the work done by the nurses sent out by the Association has been referred to as efficient and most helpful, and there seems a tendency on the part of the Colonial Office to incorporate the nurses sent out by the Association as Government employés, and to grant them the privileges of pension attaching to recognition of the kind. Lord Ampthill, when moving the adoption of the report, said funds were wanting for the advancement of the Association, and that there were few better ways of showing interest in the Empire than by providing means whereby the public servants of the Crown in distant colonies could be provided with skilled nursing when they were struck down by illness. Sir Frederick Hodgson, in seconding the adoption of the report, testified to the valuable work done by skilled nurses in the colonies with which he was acquainted.

We can add our testimony from several independent sources as to the benefits accruing to the communities in which the nurses of this Association have worked, and it is to be hoped that the members of the committee of management of the Association will in course of time associate with them in their work those who have had practical experience of nursing in tropical colonies.

AN IMPROVED METHOD OF STAINING FOR SCHÜFFNER'S DOTS, &c.

The following method has produced results so far better than any which I have seen described, that a brief note may be worth publishing; it has also given most excellent results in slides of tropical malaria taken eight months ago, the chromatin being very well stained.

After fixing with absolute alcohol, the slides are dried and at once placed in slide jars containing Giemsa's solution 1-10 to 1-15 until they are deeply, and in fact over-stained (one to three hours should be enough). They are then quickly but thoroughly washed in plenty of water—clean rain-water does not spoil the results, and while still wet, but drained, one or two drops of pure methyl alcohol are dropped on the slide held obliquely, two to three seconds is long enough, and they are at once washed in water, dried, and mounted in the usual way.

Staining with Giemsa on the slide is no good, though it is hard to say why. In a successful prepara-

tion Schüffner's dots are very brilliant, and the substance of the corpuscle is only faintly seen. Washing with methyl alcohol after drying the slide is not quite so good a method as the above, especially with old films.

Reviews.

THE ANÆSTHETIC TECHNIQUE FOR OPERATIONS ON THE NOSE AND THROAT. By A. de Prenderville. (London: H. T. Glaisher, 1906, pp. 88. Illustrated).

Medical men called up to administer an anæsthetic in cases of nose and throat trouble are apt to be anxious as to their capacity to carry out the administration in a manner satisfactory to the patient and the surgeon. The anxiety is natural and justifiable, as any lesion of the respiratory passages tends to increase the difficulty and danger of anæsthesia. In large cities expert anæsthetists, being at hand, should be employed; but in the tropics, as a rule, every medical man has to undertake the administration of anæsthetics in cases of the kind. Dr. Prenderville's book to men so situated should prove a useful and invaluable help, as anæsthesia in nose and throat operations is always fraught with anxiety, and attended by a considerable element of danger. A perusal of Dr. Prenderville's book will enable inexpert anæsthetists to go to work with a degree of confidence they were perhaps not previously possessed of.

Notes and News.

ONE of the difficulties connected with the treatment of plague in India is to convince the people of the advantages of the evacuation of premises in which one or more cases have occurred. They cling to their houses, and thus a whole family may die in rapid succession or in periods extending over weeks. The investigations of the Advisory Committee on Plague, which is pursuing its researches in India, prove beyond question that while the disease is not particularly infectious or contagious and man-to-man infections do not play any important part in spreading it, that rooms and houses in which cases have occurred among persons or rats are very infectious during an epidemic. Those who live or sleep in such places are liable to contract plague, whereas close attendance on patients in hospital or in segregation camps is seldom dangerous. Further, even after houses have been evacuated for a month or even longer, the disease clings to them, and their re-occupation is full of danger. These facts cannot be too widely made known, and they confirm opinions that were formed some time ago. Evacuation, to be effective, must be promptly carried out, and three months may be taken as the period over which it should extend.—*Pioneer Mail.*

PLAGUE INSPECTION IN BURMA.

A SERIOUS FRACAS.

A FRACAS took place in Maymyo Bazaar the other day on the occasion of the first plague inspection by Captain Simpson of certain houses lying to the east of the town, where the *garry-wallahs'* or cabmen's quarters are situated. Captain Simpson was accompanied by Mr. Kirkpatrick, sanitary inspector, and a gang of coolies, with two civil policemen for protection. It was necessary to enter a house where a suspicious case of illness had occurred, but on Captain Simpson attempting to do so the owners resisted, and in a trice a large crowd had collected, numbering two hundred men, who had evidently been in readiness for a row. They attacked the plague gang with sticks and stones, and Captain Simpson was struck with a brick and Mr. Kirkpatrick was somewhat seriously injured. The two policemen were helpless. The matter being reported, a strong body of police started at once with Mr. Murray, D.S.P., and Major Townsend, D.C., to the scene, and some twenty men were arrested and committed for trial. As a result of this all the *garrywallahs* in Maymyo went on strike. Measures are being taken which will probably bring them to their senses, but the strike will affect the Burman and native community chiefly, for these are almost the only customers of *ticca garries.—Pioneer Mail.*

HONOURS TO BRITISH RESEARCH LABORATORIES.—Although scientific research receives little encouragement in this country, it is gratifying to find that the labours of British scientists are recognised abroad. The awards to the British Section of the recent Liége Exhibition were distributed at the Mansion House on June 13th, and the following presentations were made:—Wellcome Chemical Research Laboratories, one grand prize, one diploma of honour, and two gold medals; Wellcome Physiological Research Laboratories, one grand prize, and two gold medals. Medals were also awarded to the respective directors of these institutions.

WE refrain from comment upon the tinned meat scandals, although the matter is one of vital importance to tropical residents and travellers. The "scandals" were well known to us for some years, and avoidance of all preparations derived from "meat" in any form has been urged by us in the case of invalid dietary. Fresh beef tea, freshly made meat jellies, freshly prepared scraped beef, have been advocated by all medical men, in preference to the much advertised tinned, canned, or bottled substitutes for the same. It required, however, a sensational "novel" to bring the matter home to the public, and we cannot be too thankful to the writer of "The Jungle" that the whole question of "beef-teas" should have been raised. Medical men, however, can hardly be said to be free from blame in the matter, as they are too apt to yield to the desires of their patients to try some over-advertised "meat juice" or "beef extract." Though less nutritious than ordinary egg albumen, bulk for bulk, and in no sense better or more digestible, some of these may be harmless enough, but their adoption involves heavy and needless expense on people who are often ill able to afford it; and the profession might do much to combat the evil by resolutely refusing to countenance the use of all preparations of the sort

except in the rare cases where the wholesome fresh materials are absolutely unobtainable. All medical men who desire to be ready with arguments as to the valuelessness of these much puffed articles should read Dr. Robert Hutchison's excellent pamphlet on "Patent Foods and Patent Medicines," and the booklet is so plainly written that the laity might do worse than follow their example.

By the death of Professor Schaudinn at the early age of 36, science has sustained an irreparable loss.

Rat Fleas and Plague.—An experiment made in Bombay seems to favour the belief that rat fleas convey plague. In a room in which a rat died of plague a number of rats in cages were placed; some of the cages were screened, some unscreened. The rats in the unscreened cages contracted plague, whilst the rats in the protected cages escaped.

Dr. Nuttall, F.R.S., has been appointed Reader in Hygiene at Cambridge University.

Readers of the Journal will regret to know that Lieutenant-Colonel J. E. Nicholson is about to leave England. We are thereby deprived of the valuable assistance he has rendered to the Journal for some time past.

Lahore Medical Students, owing to alleged harsh and unsympathetic treatment by their native superiors, to the number of 250, have gone "on strike." We hope soon to hear that the students' grievances have been satisfactorily settled.

Examinations for entrance into the Royal Army Medical Corps will be held on July 26th 1906. There are forty vacancies.

Examinations for entrance into the Indian Medical Service are to be held on July 9th, 1906. There are twenty vacancies.

Dr. J. L. Todd informed the African Trade Section of the Liverpool Chamber of Commerce that in the area of country in Africa infected with sleeping sickness some half a million people died of the disease during the last ten years. Sleeping sickness had spread along the trade route opened up in recent years, and as a means of combating the disease it was suggested that medical posts of inspection should be established at regular distances, so that persons suffering from the disease should be prevented from travelling to districts as yet uninfected.

Department of Health, Isthmian Canal.—Colonel Gorgas reports that during the month of April, 1906, there were no cases of yellow fever, plague, or small-pox amongst those employed on the canal; no case of plague since August, 1905, no yellow fever since December, 1905, and no small-pox during the preceding year. The general health of all sections of the community in the canal zone has much improved lately. Pneumonia was the most serious ailment. The systematic cleansing, disinfection, and destruction of mosquito breeding-places is being maintained.

Personal Notes.

Rutherford, Dr. G. J., Medical Officer of the Gold Coast Colony, has been transferred to the Medical Department of Southern Nigeria.

Indian Medical Service.

Promotions:

Lieutenant-Colonel W. Gawen King, C.I.E. (temporary Colonel) is confirmed in that rank, and in the appointment of Inspector-General Civil Hospitals, Bengal.

Retirements.

Colonel Andrew F. Dobson (Madras), Colonel Stephenson Weir (Bombay), Lieutenant Colonel J. Anderson, I.M.S.

Leave.

Captain C. Thomson, priv. leave, 6 w.
Lieutenant-Colonel J. L. Poynder, combined leave, 6 m.
Captain V. E. H. Lindesay, combined leave, 1 y. 51 d.

Postings.

Captain W. Selby, additional Visiting Charge, Budaun.
Captain C. H. Bensely to be Superintendent, Lahore Central District, and Female Jails.
Lieutenant-Colonel H. Hendley to be Civil Surgeon, Lahore; Professor Midwifery, Lahore Medical College; and Medical Officer, Government College.
Captain C. S. Lawson is confirmed Superintendent Central Jail, Ahmedabad.
Captain A. F. W. King to be Professor, Institute Medicine and Pharmacy, Grant Medical College, and Resident Surgeon St. George's Hospital, Bombay.
Captain E. H. G. Hutchinson to be Civil Surgeon, Ratnagiri.
The services of Captains Trafford, Pilkington, Laudder and Dunn, and Lieutenant Gill, have been placed at disposal of Punjab Government for plague duty.
Major A. Buchanan to be Civil Surgeon, Nagpur.
Major E. A. R. Newman officiates as Civil Surgeon, Ranchi.
Captain C. A. Lane officiates as Civil Surgeon, Bhagalpur.
Captain J. G. P. Murray acts as second Surgeon, Presidency General Hospital.
Captain H. B. Steen to be Civil Surgeon, Purnea.

Geographical Distribution of Disease.

As information arrives we publish, under this heading, the principal diseases met with in tropical and sub-tropical countries, so that those interested in the Geographical Distribution of disease may have a means of gathering information concerning the prevalent ailments in different parts of the world.

Philippines.

Opisthorchis sinensis was discovered in a Japanese patient by Dr. R. P. Strong, and reported by W. J. Mallory, on March 2, 1905, at the annual meeting of the Philippine Islands Medical Association. The parasite inhabits the bile ducts and gall bladder of man, dogs, and cats. It has been met with in the pancreas and occasionally in the duodenum. The fact that the parasite has never been previously described as occurring in the Philippines does not point to infection of the natives of the Philippines, as the patient was a Japanese, and it is well known that the *O. sinensis* is widely prevalent in Japan.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"C. R. Soc. de Biologie," T. lx., p. 160.

ON SOME NEW TRYPANOSOMES OF FRESH WATER FISHES: THEIR EVOLUTION AND METHOD OF TRANSMISSION.

Brumpt, E., describes ten new species of *Trypanosoma* and four of *Trypanoplasma*, and states that the former undergo an evolutionary stage in leeches of the genus *Hemiclepsis*, and the latter in either *Hemiclepsis* or *Pisciola*. Some species of the trypanosomes develop entirely in the stomach, others first in the stomach afterwards in the intestine, and finally the parasites are found in the sheath of the suctorial mouth; while a third category, such as *T. Danilewskyi*, develop first in the stomach and then in the mouth-sheath. The development of *T. granulosum*, sp.n., of the eel is described in greater detail. The forms found in the stomach are pear-shaped, with the centrosome near or in front of the nucleus. These multiply actively in the stomach, but the forms met with in the intestine are very elongated, resembling *Herpetomonas*, while those found in the mouth-sheath are of the trypanosome type, and the parasites with which the fish are inoculated by the leeches are always of this form.

Those developing in the stomach have the peculiarity of losing their flagella and undergoing several fissions in this form before regaining their lashes.

"Archiv für Schiffs und Tropen Hygiene," vol. x., No. 2.

PROPHYLAXIS OF MALARIA.

Celli believes (1) that the exhibition of quinine as a means of preventing malarial fever should be continued daily in doses of 6 to 9 grains (40 to 60 centigrams). (2) The addition of arsenic and iron to the quinine in chronic malaria is probably useless. (3) The best form of administering quinine is in the form of the bisulphate or hydrochlorate in sugar-coated pills. (4) Cinchonism is more apt to prevail when quinine is given at intervals of some days than when exhibited daily. (5) The tonic effect of quinine is of value in persons infected with malaria.

Although quinine-taking is a valuable prophylaxis, it should never be allowed to interfere with the sanitary measures calculated to eradicate the Anopheles from the malaria-infected area. Whilst new ground is being opened up, and until sanitary measures are fully established, there can be no doubt quinine is the most efficient of all prophylatic measures.

"Wien Med. Wochenschrift," October, 1905.

THE TREATMENT OF DYSENTERY.

Kraus and Dörr have come to the conclusion that the *Bacillus dysenteriæ* are not identical. From Shiga's bacillus a soluble toxin has been isolated, and the type of dysentery it causes is that of a local bowel infection where the toxins are elaborated, resembling the action of the diphtheria bacillus. No toxin has been isolated from the bacillus of Flexner, so that the poison is intracellular, comparable to the bacilli of typhoid and cholera. Kraus and Dörr have produced an antitoxin which has proved effectual in cases of dysentery due to the *Bacillus dysenteriæ* of Shiga; 20 cc. of the antitoxin were injected subcutaneously, and the signs and symptoms of dysentery speedily subsided. The antitoxin is of no value in counteracting the intracellular poison of Flexner.

"Bulletin General de Therapeutique," November 23, 1905.

GENTIAN IN THE TREATMENT OF MALARIA.

Tauret, Dr. George, has isolated a glucoside from the fresh root of gentian, termed gentiopicrine. This drug, in doses (cachets) of from 7 to 46 grains, was administered in definite cases of malaria, some two to four hours before the probable onset of the malarial attack. As gentiopicrine in large doses acts as a purgative, it should be given with the food, or a little bismuth may be administered with it.

Beside gentiopicrine, another glucoside, gentiomarine, is met with in gentian, and the combination of these two glucosides may be exhibited as an alcoholic extract of fresh gentian root in syrup. The treatment may be required to be continued from one to three weeks.

A CASE OF TROPICAL ULCERATION INVOLVING THE NOSE, PHARYNX, AND LARYNX, WITH HISTOLOGICAL FINDINGS.

Arnold, W. F., and Fordyce, J. A., in a paper read before the American Dermatological Association in December, 1905, described a granuloma, involving the nose, pharynx and larynx, termed "tropical ulceration" of these parts. The microscopic findings excluded blastomycosis, actinomycosis, rhinoscleroma, leprosy and tubercle; syphilis and yaws were also excluded by the fact that the usual specific remedies for these diseases were ineffectual. Mycosis fungoids seemed to be negatived as a cause owing to the absence of fragmentation and the character of the infiltrate.

"Philippine Journal of Science," January, 1906.

TROPICAL ULCERATIONS OF THE SKIN.

Strong, R. P., describes tropical ulcerations of the skin, as met with in the Philippines, under three headings: (1) Cases resembling Oriental sore; the lesion is single and in the surrounding tissues Strong found "cockle shell" oval bodies, in diameter from 3 to 4 micra, resembling Leishman bodies, and met with free and within endothelial phagocytic cells. They are regarded by Strong as parasites and to be forms of blastomyces. (2) Cases in which the lesion is single, commencing as a red spot which enlarges, hardens, discharges and scabs. No protozoa were found, but a bacillus of the *Staphylococcus pyogenes aureus* native was met with. (3) Cases in which the lesion is multiple, beginning as vesicles or pustules and breaking down into ulcers.

Bacteria do not seem to act as a causative factor in this group, which may be due instead to a blastomycytic agent, although no organisms of this nature have been observed.

"Journ. Exper. Zool.," vol. ii., p. 585.

THE EVOLUTION OF THE HYPOTRICHOUS INFUSORIA.

Woodruff, L. L. This is a sequel to Calkins' remarkable study of the evolution of the Paramœcia, and has been carried out by his methods and under his direction, though the results are hardly as definite. The observations were devoted to *Oxytricha fallax*, *Plerotrichia lanceolata*, and *Gastrosyla steinii*, the culture medium being hay infusion. All three species multiplied steadily by transverse fission without conjugation, passing directly through periods where the division was less frequent, but in the end all die unless the race be rejuvenated either by conjugation or by change of medium. Like Calkins, he found that a cultivation that had become very languid revived at once to a considerable extent by substituting beef infusion for hay infusion, but a second experiment was not so successful, and the series died out in 20½ months after the very considerable figure of 860 asexual generations. The periods of depression were characterised not only by feeble multiplication and the commonness of pathological forms, but by alterations of the protoplasm, which became more and more vacuolated, the macronuclei broke up, while the micronuclei became more numerous, and lastly the ciliary apparatus atrophied. This was associated with an increase in the size of the individuals, which become smaller as the rate of multiplication accele-

rates. No inclination to conjugation was ever noted in the cultivations, and all attempts to bring this about failed.

Numerous observations were made on the action of various salts. KH_2PO_4, K_2SO_4 and KBr applied once accellerated, whilst K_2HPO_4, KCl, NACl and $MgSO_4$ retarded division. In daily doses $K_2H\ PO_4$ and KBR markedly accellerated, while KH_2PO_4 KCl and NACl strongly retarded division.

Light appeared to have no direct influence on the rate of division of *Oxytricha fallax*.

"Bulletin de L'Institut Pasteur," T. iv., p. 346.

Prof. Mesnil, in Kolle and Wassermann's "Handbuch der Pathog. Mikro-organ." G. Fisher, Jena.

Nocht, B., and Mayer, Martin, on the pathogenic trypanosomes. This chapter of the above handbook gives a clear and definite picture of this important subject. Passing over the history of the subject, the authors proceed at once to define the two genera *Trypanosoma* and *Trypanoplasma*, and describe the methods of examination and the cytological and evolutionary characters of these organisms. Stress is laid on Prowazek's work on *T. Lewisii* and on Schaudinn's views on the hæmatozoa of birds, though they have not been able to include the more recent investigations of the latter authority, which have led him to considerably modify his views as to the inter-relations of the trypanosomes and the spirochætes.

In any case they should have noticed the views of Novy and McNeal, which are opposed to those of Schaudinn.

The authors adopt Koch's classification, and, although it is not usually a pathogenic organism, commence with the study of *T. Lewisii*, on account, no doubt, of the large amount of attention that has been devoted to that species.

The chapters on *nagana*, *surra*, *caderas*, *dourine*, *galziekte*, Gambian trypanosomiasis and sleeping sickness, are well written, and usually uniform and well balanced, and include a certain number of personal observations, notably on the pathogenic action of the two races of *T. Gambiense* on different animals. The analyst considers, however, that it would be more logical to place Zousfana disease beside Debat in the chapter on surra instead of including it with nagana, especially as they very justly insist on the difference between surra and nagana, based on the difference between the insects which act as vehicles of these diseases. The therapeutics of this subject are condensed into a separate chapter, and it is somewhat surprising to find no mention either of atoxyl or of the arsenic-trypanroth combination.

The non-pathogenic trypanosomes of mammals and other vertebrates are barely mentioned, nor are those which are almost undoubtedly pathogenic in fish, and which might well have formed the subject of a separate chapter. The tsetse flies are dismissed in a couple of pages, but an excellent double plate in contours somewhat compensates for this brevity. The other coloured plate gives a good idea of *T. Lewisii*, and of the various pathogenic species, and the microphotographs are equally successful.

Proceedings Royal Society, Series B., vol. lxxvi., p. 284.

THE DEVELOPMENT OF THE HERPETOMONAS OF KALA AZAR AND CACHEXIAL FEVER FROM LEISHMAN-DONOVAN BODIES.

Rogers, Major Leonard, I.M.S., who claims to have discovered flagellate forms of the *Piroplasma Donovani*, investigates the conditions most favourable to the development of these forms. He has already stated that these are best met by the employment of citrated human blood, slightly acidulated with citric acid, and it is further important that the medium should be free from bacteria, which impede the development of the parasites and bring about their degeneration. The most favourable temperature is 22° C. With Novy's medium (gelose blood) the results were negative. Under these conditions the small piroplasma forms, obtained by spleen-puncture, undergo rapid development, the course of which is clearly shown in an accompanying plate. After forty-eight hours the parasites have attained their largest dimensions, and some flagellate forms appear. The small nucleus or centrosome is now in relation with an eosinophile body which is constantly found in the subsequent flagellate forms. These latter, during subsequent days, are alone found, and are typical Herpetomonads. The centrosome is always in front of the nucleus and no trace of undulating membrane can ever be made out. Major Rogers proposes to call this the parasite of Kala Azar, and if, as thus seems possible, the Herpetomonoid forms of his cultures represent the most evolved stage of the organism, the term *P. Donovani* should sink, and *Herpetomonas Donovani* should be substituted for it.

Longitudinal division of the flagellate forms is also figured and described. The author remarks that the fact of acidity of the culture medium being favourable, tends to the probability that the intermediate host of the parasite is an insect, and he has actually obtained flagellate forms by mixing infected spleen blood with the stomach juices of a louse. Lastly, the fact that a temperature of 22° C. is most favourable to the development of the parasite explains the seasonal prevalence of the disease.

Journal of Tropical Veterinary Medicine, vol. i., p. 5.

A NEW TRYPANOSOME OF RATS.

Lingard, A.—The specimens described were found in the blood of *Mus niviventer* and *M. decumanus*, and differ from the types of *Trypanosoma Lewisii*, with which they are associated in having the hinder end so produced as to resemble a posterior flagellum, much longer than the true anterior one. The portion of the parasite behind the centrosome averages 19 μ., as against 6 μ. in Lewisii. In other respects, *e.g.*, in the forward position of the nucleus, the new species, which he names *T. longocaudense*, recalls *T. Lewisii*. The author proposes to facilitate the recognition of species by recording the length from the centrosome to the hinder extremity, that from the centrosome to the nucleus, the length of the nucleus, that from the anterior border of the nucleus to the anterior end of the body of the parasite, and the length of the flagellum; the sum of the five data giving the total length, and lastly, the greatest breadth. He gives their measurements for his new species, for *Lewisii*, *Evansi*, *equiperdum*, and for a trypanosome which he calls *Himalayanum*, found by him in the blood of cattle in the hills. This last is a long, thin species 75 m. long by 3·25 m. wide.

"C. R. Soc. Biologie," T. lx., p. 124.

A CASE OF SPIRILLOSIS IN THE HORSE, OBSERVED IN FRENCH GUINEA.

Martin, Gustav, describes a spirillum 12-15 μ long, by 0·25 μ wide, with 3-4 turns in the spiral. When observed, the horse was wasted and showed arching of the back with paresis of the hind quarters. Inoculation of other animals gave negative results. Two and a half months after, the horse was in good condition and its blood free from spirilla.

"Centralbl f. Bakter.," I., Original, T. xl., p. 405.

THE MODIFICATIONS OF THE SERUM OF INTERMEDIATE CARRIERS OF THE CHOLERA VIBRIO.

Friedberger, E. By the term intermediate carriers of cholera (cholerabazillenzwischentragern) the author refers to persons who, though to all appearance perfectly healthy, continue for some time to eliminate cholera bacilli in their stools. During the last epidemic in Germany he met with three cases of persons isolated from infected places, who, without even showing the least sign of cholera, nevertheless for periods of from three to nine days produced stools containing cholera vibrios. On testing the serum drawn from these persons it was found to have a bactericidal power 100 to 500 times above the normal; while on the other hand the agglutinating power alike for the cholera and for other vibrios was scarcely appreciable. To explain the presence of these peculiar properties in the serum of

these persons, the author assumes that they must have suffered from an infection of the intestinal mucosa, but of so mild a character as to arouse no suspicion of its existence in their minds; as in persons having normal intestinal mucous membranes, enormous quantities of microbes require to be introduced to produce such marked modification of their serum.

The observation is, of course, of great practical interest, as it explains how the infection of cholera may be introduced into new localities, at great distances, by a person showing no sign whatever of disease.

"Zeitschrift f. Hygiene," T. lii., p. 263.

THE ACTION OF "BRILLIANT GREEN" ON THE NAGANA TRYPANOSOME.

Wendelstadt, H., and Fellmer, T., are continuing their researches on the treatment of nagana with the colours of the triphenylmethane series. The authors have tested the action of this colour (sulphate of tetraethyldiparaamido triphenylcarbinol) in the same way they have already tested malachite green. Like the latter colour, but in a less degree, this green has the drawback of causing sloughing when used hypodermically, and of producing irritation and atrophy of the spleen when introduced into the peritoneal cavity.

Doses of 1 cc. of a ½ per cent. aqueous solution hypodermically, or of 1 to 2,000 to 2,500 into the peritoneum, uniformly brought about the disappearance of the *Trypanosoma Brucei* from the circulation of rats infected four days before with nagana. But the trypanosomes reappeared after six or seven days, so as to make a fresh dose necessary. Under this treatment, they succeeded in keeping a rat as long as seventy-two days, while control animals died in five to six days, but in the end the animals under treatment succumbed to poisoning with the drug, and in no case was a cure obtained.

The best plan of administration is in three successive doses of 1 cc. of ½ per cent. solution, on the fourth, sixth, and ninth day after infection. Following up Laveran's experiment of combining arsenic with trypan-red, they tried the effect of following up the three doses of the dye by a daily injection of 1 mgr. of arsenic. In three series, out of ten rats, one rat in the first series alone appears to have been cured, doses of 3 cc. of its blood failing to infect. In the second series the blood of four rats killed during the course of the treatment, was not infective in doses of 2 to 3 cc.; four others died no doubt from poisoning with the dye; one relapsed, and only one has been cured, being still alive after five months. This was the only instance of cure, other animals having been kept up to four months, but without being cured, and the authors attribute the comparatively good results obtained in this series to the fact that the treatment was commenced forty-eight hours after infection, and not as usual after three days. It is noteworthy that rats inoculated with the blood of some of the animals under treatment showed after a fortnight numbers of trypanosomes, which presented a vague outline and a generally curious appearance, and which disappeared the next day, but these rats showed no immunity two and a half months after.

A Macacus rhesus monkey was also treated; and as the first treatment with the green alone did not suffice, the combination with arsenic was adopted. After about seven months of repeated efforts the monkey is definitely cured, and it is an interesting and probably unique fact that it has since proved refractory to two successive inoculations with trypanosomes. In doses of ½ cc. the serum of this monkey causes the immediate disappearance of the trypanosomes from the blood of strongly infected rats, and is strongly agglutinating *in vitro*, while the serum of normal monkeys has no such action. A dog was also experimented on, but without much success. The rest of the memoir is occupied with a description of the changes produced in the trypanosomes under the action of the dye. A large clear vacuole appears around the centrosome, and a variety of other involution forms, which the authors compare to the Leishman-Donovan bodies, are described in the spleen, but the significance of these changes is uncertain.

"Transvaal Medical Journal," May, 1906.

ANKYLOSTOMIASIS IN TRANSVAAL MINES.

The above journal, in an editorial headed "Danger," draws attention to the prevalence of ankylostomiasis among the native miners on the Witwatersrand; the ova of the ankylostomum have also been found in specimens of underground soil. Although these facts are new, the journal remarks that it seems inexplicable that a vital matter such as the spread of ankylostomiasis should be treated with mysterious silence and inactivity. On this subject it may be remarked that the reports of medical men are, as a rule, disregarded by the community, and it requires some lay novelist or penny-a-liner in the lay Press to conjure up an alarming picture with an hysterical pen to bring the matter home to the people.

THE INCREASE OF MEDICAL MEN IN THE TRANSVAAL.

At the recent annual dinner of the Transvaal Medical Society the matter of the influx of medical men was spoken of with some concern. The accession to the ranks of medical practitioners was stated to be out of all proportion to the increase of population. The increase of contract practice and how to stem it is the problem which at present confronts the medical profession in the Transvaal, for there can be no doubt this sort of practice, once begun, is difficult to get rid of. Whilst the total earnings of the medical profession in the Transvaal have probably decreased since the pre-war days, the number of practitioners has doubled. Under these circumstances it is difficult to find a ready solution, but were the medical papers in Britain to make it widely known that the Transvaal is "over-doctored" at present, a check might be given to still further congesting the already plethoric ranks of the profession in South Africa.

"The Journal of Experimental Medicine," May 25, 1906.

THE RELATION OF TYPES OF DIARRHŒA IN CHILDREN TO STRAINS OF BACILLUS DYSENTERIÆ.

Knox, J. H. M., and Schorer, E. H., from their inquiry into this subject, found that the association of the dysentery bacillus with diarrhœa in infants is now established. After the study of 74 cases of diarrhœa in infants they found: (1) The Shiga type of bacillus present to the exclusion of other pathogenic species on aerobic plates in 4 cases. (2) The "Y" bacillus of Hiss was proved to be present in 14 cases. (3) The Flexner-Manila bacillus occurred in 3 cases. (4) Cases in which the dysentery bacillus was isolated, but not determined, numbered 3. (5) A lactose-fermenting dysentery-like organism was obtained in 2 instances. (6) Combined dysentery bacillus and streptococcal infection occurred in 11 cases. (7) Streptococci only were encountered in the pathogenic bacterial species in 6 cases. (8) A pathogenic colon bacillus was isolated in 2 cases. (9) No pathogenic organism or organism agglutinating with the patient's blood was found in 10 cases. (10) More than one bacillus was present in 13 cases. The combinations were as follows:—Group 1 and 4, 2 cases; group 1 and 2, 3 cases; group 1, 2 and 4, 2 cases; group 1, 2, 3, 4, and lactose, 1 case; group 2 and 4, 5 cases.

Bacilli dysenteriæ occurred in 73·1 per cent. of cases studied, or without the lactose-fermenting organism, which is probably not a true dysentery bacillus, 70 per cent. The character of the intestinal lesions found at autopsies were extremely various and without definite relation to the types of infecting dysentery bacilli; and it would appear that no distinction, except possibly as regards degree, can be drawn between the lesions produced by any of the given types of the dysentery bacillus.

The serious nature of the ailments from which the observations were taken may be gauged by the fact that 31 children of the 74 in question died.

"Il Policlinico," Rome, June, 1906.

THE EFFECT OF THE X-RAYS ON MALARIAL DISEASES.

"L'azione dei raggi Röntgen nell'infezione malarica." By Dr. Alberto Demarchi.

For obvious reasons it was not an easy matter to study the action of the X-rays when applied directly to the malarial parasites; for this reason Dr. Demarchi had to restrict his observations mainly to the region of the spleen, but his studies were equally directed to all three species of malarial infection, whether quartan, benign tertian, or æstivo-autumnal.

A microscopic examination of the blood was always made both before and after the application of the X-rays, as also some hours after it.

In all the cases the rays were applied daily, and at all periods of the attack of ague. No accidents had to be recorded, whether local or general, with one solitary exception when a slight erythema appeared over the irradiated region. The patients were subjected to rays with a penetration of No. 6 Benoist, and the quantity of the rays absorbed at each sitting was equal to 2 H units.

The results of Dr. Demarchi's researches may be summed as follows :—

(1) The application of X-rays over the splenic region does not affect or in any way modify the course of the malarial attack.

(2) These applications exercise no action whatever on the number, the vitality, or the normal cycle of development of the malarial parasites of whatever species they may belong to.

(3) They are not capable of causing or of accelerating a relapse.

(4) The X-rays have a manifest action on the reduction of the swelling of a spleen if chronic.

(5) These rays may possibly exercise a favourable action in preventing relapses of the infection.—(J. E. N.)

"Journal of the American Medical Association," May 12, 1906.

TREATMENT OF SNAKEBITE.

Crum, C. W. R., M.D., treats bites of the copperhead snakes by freezing the area around the bite with ethyl chloride spray; he then makes two parallel incisions almost an inch in length, through the wounds made by the fangs; the part is then soaked for a few minutes in strong permanganate of potassium solution and dressings applied wet with this solution; the edge of the dressing is raised every half hour or hour and a fresh permanganate solution poured on the wounds.

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Original Communications.

VERRUGA PERUANA.

By M. D. Eder, M.R.C.S., L.R.C.P., B.Sc.Lond.

Dr. Tamayo[1] may fairly claim to have solved this mystery of the High Andes. The disease has been known to Europeans since the sixteenth century, and, as Hirsch observes, its mortality for the white man was made manifest when it caused the death of more than one-fourth of Pizarro's small army of 700 men. In later years even greater havoc has been wrought. In 1874 a party of 40 sailors deserted from a British ship to work upon the Trans-Andean Railway; in the course of seven or eight months 30 were dead of verruga.

Hirsch gives the mortality as 6 per cent. for Indians and negroes, 12 per cent. to 16 per cent. for whites, amongst whom in epidemic form it may reach 40 per cent.

Regarding the nomenclature, the term "Carrion's disease" has been applied to the pernicious febrile form since 1885, when Daniel Carrion, a Peruvian medical student, inoculated himself in both arms with the blood taken from a verruga excrescence. He developed a severe illness on the 21*st* or 23*rd day* and died fifteen days later, *without the appearance of any eruption*. It is also known as Oroya fever, from the narrow valley of Oroya, where the disease is endemic.

I can find no one previously to Dr. Tamayo who has considered the possibility that the verruga and the severe symptoms of Carrion's disease are independent conditions, having a purely coincidental relationship. Dr. Tamayo does indeed hint at the verruga being favoured by the more serious disease, but I think this must have been an idea thrown out to lessen shock among his audience.

From my own experience I should say there is no disease in South America (and I speak from knowledge gained in three Republics) which is so frequently overlooked or wrongly diagnosed as enteric fever. In recent years malaria could be excluded, of course, by a blood examination, not always, however, for it is a frequently co-existing condition in other diseases. But a positive diagnosis of enteric is something quite different. The Widal reaction was not available in the Hinterland, away from laboratories; I should imagine that the Parke-Davis's Typhoid Agglutometer might prove of immense value to the medical man in isolated districts where laboratories and consultations are unattainable.

The possibility that Carrion's disease is enteric fever is so engrossing in itself, and so important is the question of enteric fever in the tropics, that some little attention to the current descriptions of verruga will not be without general interest.

Tamayo himself suggests that Carrion fever is a para-typhoid disease; I should be content to leave it at that, but I must draw attention to a few weak points in his paper.[2]

(1) The doses and strengths of the inoculation experiments are vaguely given as a few drops, a strong dose, &c. The author refers to a table which does not, however, accompany the articles, but as the paper was read at a medical meeting, the table may have been exhibited there. That table possibly gives the exact doses and strengths used.

(2) The differentiation from Eberth's bacillus or other members of the typhoid group is incomplete, more especially as no polysaccharide fractional differentiation is mentioned. But Tamayo states that he is still engaged on the complete differentiation of Barton's bacillus, and he promises to give the results in a later paper.

(3) The most serious omission is the incomplete description of the *post mortems*, both of the animals that died after inoculation, and of the patients who died during the course of the malady. We are told, indeed, that nothing particular was observed, and this even in cases where there had been during life abundant diarrhœa, enlarged liver and spleen, &c. The condition of the intestines is not once alluded to. I must ask readers not to conclude from this that no ulcerations of Peyer's glands were present. There is nothing to show that the intestines were examined. Positive evidence would here strengthen the case enormously, but the negative evidence must not be allowed to influence us too severely. Imperfect observations are a frequent fault of *post mortems* made in tropical South America as well as elsewhere.

A study of Dr. Tamayo's paper in conjunction with the following extracts will, I think, convince the most sceptical that Carrion's pernicious fever, Oroya fever —the severe fever of verruga—is nothing but enteric fever.

Relationship of Verruga to Yaws.—Manson [1] writes: "If difference there be in their clinical features between verruga and yaws, apparently it is more one of degree than of kind." Scheube [2] is to the same effect. "I am, therefore, inclined to the opinion that the two diseases (yaws and verruga) are nearly related, verruga being nothing more than a severe form of frambœsia or yaws, modified partly by the high altitudes of the region where it occurs and partly by being complicated with malaria."

On the other hand, Hirsch [3] denies any relationship, whilst Dr. Plehn [4] states, "verruga and frambœsia were formerly considered related diseases, but the former has nothing but a superficial resemblance with that skin disease." Jeanselme [5] is equally emphatic, "c'est à tort qu'on a voulu identifier la verruga avec le pian."

I will return to this question again.

Ætiology.—Certain waters of the endemic districts have always been locally under suspicion (aguas de verruga is the term). Dr. Plehn follows Hirsch, who quotes Dounon's experience; he and his followers drank the waters and were not affected. Plehn further

[1] *La Crónica Médica Lima*, Nos. 406 and 407, 1905. Apuntes sobre la bacteriología de la enfermedad de Carrión, por el Dr. M. O. Tamayo.

[2] Abstract, Journal of Tropical Medicine, May 15th, 1906. Page 159.

points out that people suffer from verruga who have never drunk the suspected waters.

Both statements are, of course, consistent with the view that the water is contaminated by typhoid excreta. (We remember that Dr. Klein swallowed a culture of Koch's cholera bacilli with impunity.) Some of Dounon's followers may have been immune to typhoid fever from a previous attack, nor would the water be the sole source of infection—direct contagion is common where there is no strict hygiene.

Pathological Anatomy.—The mucous membrane of the intestine is occasionally hyperæmic. *The solitary follicles and Peyer's glands are generally enlarged.* Sometimes ulcerations are discovered in the intestine as well as in the stomach. Scheube treats these as ulcerated verruga, but offers no proof; are they typhoid ulcers? All the lymphatic glands appear swollen, the mesenteric glands more especially so. The liver and spleen are enlarged. (Scheube and Plehn.)

Bacteriology.—In 1898 some growths were examined by Charles Nicolle [6], who reported that he had found a "microbe pathogène nouveau à ranger dans la catégorie des microorganismes dont le bacile de Koch est le type. Ce serait un Sclerothrix." M. Letulle and Izquierdo confirm the presence of an acid-fast bacillus.

The presence of this organism counts for little or nothing in the absence of inoculation experiments.

Dr. Barton's important paper referred to by Tamayo was read in 1898 or 1899 to the Sociedad Médica Union Fernandina of Lima. I can trace no reference to this paper, but Tamayo is sufficiently explicit. Barton was the first to isolate an organism from the blood of patients suffering from verruga.

Tamayo, working with Ugo Biffi and J. C. Gastiaburù, confirms all Barton's work in so far as it is morphological.

Dr. Odriozola [7] also refers to the presence of these micro-organisms in the blood, which grow readily at 37° C. on all media.

Jeanselme (loc. cit) suggests that the fever "qui est aujourd'hui definitivement rattachée à la verruga est une forme aiguë septicénique." Firth [8] thought that Carrion's death might have been due to septic infection.

Plehn, Jeanselme, and Firth (who seem tc be the only recent European writers on the subject to have seen any cases), scout very properly any connection between malaria and verruga.

Tschudi, in 1845, noted that death may sometimes occur at the commencement of the disease with typhoid, *i.e.*, septicæmic symptoms (quoted by Hirsch).

Firth suggested that the disease was due to a parasite worm, whose first stage is passed in the mud (he thus accepts the view of water being a factor in the causation). Plehn (loc. cit.) likewise broaches the possibility of some trypanosome infection. (Parasit welcher den trypanosomen vielleicht nahesteht.)

Immunity.—Jeanselme states that one attack confers a fairly long period of immunity.

Incubation of the Disease.—Carrion's fatal experiment established this at about twenty-one to twenty-three days (cp. enteric).

Varieties described in the Text Books.—(1) Fulminating, in which there is no eruption, most writers concurring in the opinion that death ensues before the eruption has time to appear. Naturally, there can be no proof of this.

(2) Pernicious febrile form (Fièvre grave de Carrion). This disease lasts two to six weeks, and has a high mortality.

(*a*) With eruption—which may appear at any time during the disease—sometimes just before death, or sometimes during convalescence.

(*b*) Without eruption.

In some fatal cases, however, verruga has been found in the internal organs (see list compiled from Tamayo, case 3. JOURNAL OF TROPICAL MEDICINE, May 15th, 1906, p. 160).

(3) Chronic form. This may drag on for years; and then, as Dr. Plehn [9] states with a touch of unconscious humour, these cases may still have a fatal issue. (Although no one has suggested that chronic verruga would confer immortality.)

Symptoms and Course.—I give the outlines from Plehn, with whom other writers are in general agreement.

Fever, remittent or intermittent, extending over some weeks. Hyperpyrexia has been known. In some cases fever falls below the normal some days before death (cp. the typhoid condition in enteric).

In favourable cases sleeplessness and other symptoms gradually disappear as the fever abates; appetite returns, and, except for the weakness, patient is well.

Headache and pains in the limbs during the first one or two weeks. Delirium, coma, nausea, vomiting, diarrhœa, dysenteric stools—more rarely there is constipation (see Tamayo's cases). The abdomen is tender. Liver, spleen, and mesenteric glands enlarged. Anæmia, sallow complexion, sometimes jaundice. Hypostatic pneumonia; cardiac failure.

Hæmorrhages from different organs.

Petechial eruption, which sometimes resembles purpura hæmorrhagica (cp. enteric; out of Osler's 829 cases, there were 25 with purpuric spots. Osler. Fifth edition, p. 17).

Differential Diagnosis.—It is significant that Wurtz and Thiroux [10] do not mention enteric amongst the difficulties. Their list of diseases with which verruga may be confused is (1) malaria, (2) acute hepatitis, (3) acute yellow atrophy, (4) acute miliary tuberculosis (5) pyæmia, (6) rheumatic fever.

Acute yellow atrophy is rare everywhere; rheumatic fever uncommon in tropical South America, but enteric is ubiquitous and common. Tamayo and his fellow workers have, I believe, proved that verruga peruana is a benign disease, running a chronic course, consisting essentially in the formation of granulomatous eruptions on the skin, and in the mucous membranes and organs.

The resemblance of these tumours to those of yaws is unmistakeable in the photographs (see them in Odriozola's work or Plehn's article). The main difference is that yaws is said not to occur in the internal organs. It does occur, however, on the mucous membranes of the cheeks, gums, and in the vulva (Hirsch). According to Van Leent, quoted by Hirsch, yaws is found in the internal organs, spleen, liver, &c. May not the fact of this having been doubted (see Hirsch) be due to the fact that the outcome of yaws is "always

towards a cure." Hence *post mortems* must be rare; whilst in verruga they have been relatively frequent, owing to the fatality of the frequently associated Carrion's fever.

As an objection to the identity of the latter with enteric fever, it may be said that there is in the clinical accounts an absence of the usual abdominal complications, such as perforation. This is true, although hæmorrhage from the bowels is noted, and amongst the sequelæ are given nervous affections. Possibly when the attention of Peruvian clinicians is drawn to Tamayo's suggestion, we may receive further information regarding the presence or absence of the abdominal complications.

To sum up, Carrion's pernicious fever is typhoid fever occurring in the tropics.

Verruga Peruana is yaws occurring in a district in Peru where typhoid is endemic. The two diseases are thus often found in the same subject.

The casual agent of verruga is unknown; hitherto, as was natural, research has been mainly bacteriological. It would, however, seem advisable to examine the freshly excised granulomata for spirochætæ, or, as Mr. T. P. Beddoes suggests to me, for some form of amœba.

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[10] WURTZ AND THIROUX. Diagnostic et Séemeiologie des Maladies Tropicales, p. 58. Paris, 1905.

A NOTE ON THE HABITS OF *ORNITHODOROS MOUBATA*.

(Observation of Two Gravid Females.)

By F. C. WELLMAN, M.D.

MR. R. NEWSTEAD in his paper "On the Pathogenic Ticks Concerned in the Distribution of Disease in Man, with Special Reference to the Differential Characters of *Ornithodoros moubata*" (read at the last meeting of the British Medical Association, held at Leicester)[1] states (what is true of most ticks) in his remarks on the family in general, that a fully engorged tick . . . after fecundation invariably falls from its host. *Egg laying takes place shortly afterwards, and the animal subsequently dies.*"[2] Later, however, in speaking of *O. moubata* he does not state the length of time between the feeding (and fecundation) of the tick observed by him and its egg laying (although he gives the dates on which the eggs were laid), nor how long the parent lived after ovipositing. Now *O. moubata* is (in some instances at least) an exception in this respect to other observed ticks, and what Mr. Newstead omits (rather than what he says) makes his sketch of the part of its life history discussed by him misleading. I extract from my recent report[1] to the American Society of Tropical Medicine concerning this tick the following observations which, if read in connection with Mr. Newstead's paper above mentioned, will give any one interested a much clearer idea of the matter. "Ticks were fed on the blood of a young pig. Copulation was seen in two instances, the ticks grasping each other with their legs and approximating the dorsal surfaces of their bodies. Two large impregnated females were placed in a covered glass dish in which was a handful of dust from the floor, into which the ticks immediately burrowed. They were given no food and examined frequently. *It was nearly two months (fifty-seven days) before any eggs were laid. Tick No. 2 did not begin to lay for a week after her companion had finished. Both ticks have been kept to date without food (eleven weeks since laying their eggs) and are still alive and active.*"[2] In each case the eggs were laid in batches and protected by the parent for several days. Their subsequent history—differentiation of the egg contents in about a week, the quiescent larvæ distinguishable a few days later, and the emergence of octopod nymphs on the fifteenth day—corresponds almost exactly with that given by the late Dr. Dutton and Dr. Todd, and as I have elsewhere published the same in detail from my own personal observations I shall not repeat it here. I have only referred to the matter in order to add important details which are missing from Mr. Newstead's paper as it appears in the JOURNAL. Of course, the paper in question may be but an abstract of a fuller communication including all the data which I have here supplied (I have not seen full reports of the meeting at Leicester), in which case, however, no harm will be done by again calling attention to so interesting and significant a point regarding the life history of an important disease carrier.

Bailundo, West Africa.
January 1st, 1906.

[1] Published in this JOURNAL for August 15th, 1905.
[2] The italics are mine.

[1] "On *Ornithodoros moubata*, Murray; a disease-bearing African tick."
[2] Six months have now passed since the ticks were fed, and about four months since they deposited their eggs. One of them (the one which laid her eggs last) died three weeks ago. The other is still alive and apparently healthy.

A CLINICAL PICTURE OF RELAPSING FEVER.

By V. G. DESAI, L.M.S.

THE following history is a pen picture of five hundred cases of relapsing fever. The description of this fever is so vague in the text books that the disease can hardly be made out by the bedside. A few of the leading symptoms are not mentioned in any book. An ordinary busy practitioner has to

depend much on the signs and symptoms of a disease. He cannot go on examining the blood of every patient who comes to him. The writer felt the necessity of such an accurately described clinical history, and that is why he has taken the liberty to write the clinical story of relapsing fever. *It is mainly a tropical disease. It is frequently mistaken for plague in Bombay during the epidemics of the latter disease.*

This fever is only prevalent among the poorer classes of people; for example: butchers, clerks, &c. Such people eat very little fresh vegetables, fruits or fish. Christians living miserably get it. In all these cases it was generally found that the patients were not taking a sufficient quantity of salt with their food. Persons in similar conditions of living are attacked, and so it is thought to be contagious, but it appears not to be so at all. It occurs among people of low vitality. Tubercular persons of fair type are more prone to it. Males are attacked more than females. It generally occurs in outbreaks. Age has nothing to do with it. It occurs in well ventilated houses.

The patient comes to the doctor for pains in the body. The fever comes on without shivering and reaches its maximum height on the second or third day. The patient appears to be very much exhausted. The facial expression indicates that the patient must have been ill for at least two or three months. His conjunctivæ are yellow or a tinge of it is usually there. There is no sickly smell about him, as in cases of typhoid or pyæmia. The temperature depends on the constitution of the person; it is higher in thin and fair-skinned people. In fat and dark-skinned people it is less marked.

The skin in many cases is coloured a light yellow, while in some the colour is distinctly marked. A small-pox-like eruption is occasionally seen, but has not the shotty feel.

Respirations are increased to thirty or more. Percussion shows a little hyper-resonance. The respiratory phenomena look like that of hæmorrhage—probably due to the destruction of red blood corpuscles by the spirilla. Similar breathing is noticed in pneumonic plague.

The pulse is always rapid, about 100, but good. The heart-sounds are feeble, but not so feeble nor obscure as in plague. Percussions over the heart show that the cardiac dull area has diminished, while in plague it is increased from dilatation.

The appetite is poor. Vomiting is a rare symptom. In one case it was very marked. Vomiting of blood occurred in one case. Constipation is usually present, and if a purgative be given the stools do not smell as in typhoid. Large doses of calomel do not induce diarrhœa. The motions are dark-coloured (iron-laden stools), probably due to the destruction of red blood corpuscles. Distention of abdomen is a very rare symptom, unlike typhoid. Assimilation is very poor. The patient becomes markedly emaciated even in one week, in spite of careful nursing. The spleen is enlarged and very tender, as also the liver, but not to the extent of the spleen, and is less tender. Tenderness of spleen is prominently marked in all cases. General glandular enlargement is a rare symptom. The tongue shows irritation. It is thickly furred and moves less freely, resembling a "liver" tongue. Such a tongue is seen in cerebro-spinal disease. The tongue at once makes one suspicious of plague, but it is not so foul. It shows that the patient must have been ill for two or three months, although he may have been ill only for two or three days. It gets worse and worse in spite of treatment. By the last two days the tongue becomes small in mass, dry and leathery. The teeth become dry and sordes collect on them, and the look of the face is like that of a cadaver.

Urine is very red and of high specific gravity. Traces of bile are present, chlorides are less.

Intelligent people complain of pain in the epigastrium, while dull people say they have the pain in the abdomen. Pain in the calves is a very prominent symptom, and present in one and all cases. Pain all over the body is complained of, but it is more in the muscles and tendons than in the bones. The pain is more marked in the anterior parts of the body—with the exception of the calves—and the flexors. There is no severe pain in the head, as in typhoid fever, nor is there any pain in the back-bone and neck, as in cerebro-spinal fever. The patient does not sleep during the period, in spite of big doses of opium. He is neither delirious like a typhoid patient nor dull like a plague patient. The mental power is clear, but the calculating power of the brain is affected.

The muscular power is reduced from the commencement. He cannot even sit for any length of time, but, unlike a plague patient, he can walk straight.

In spite of treatment the patient gets worse and worse, and towards the end of the fever the typhoid state is pronounced. Suddenly, on the seventh, eighth, or ninth day the temperature falls to subnormal, either with profuse perspiration or with diarrhœa, or with vomiting of blood, or epistaxis. While the temperature is going down the patient asks for food. The jaundice remains behind for a week after the fever has fallen to subnormal. In the interval after the fever the patient seems well. He eats greedily and seems to make up for the loss of food in the week previous. He does not complain of any pain or any after effects (except jaundice). The only symptom that remains behind when the fever has left is jaundice, and especially when it has been marked. He gets good sleep. The motions become yellow. The spleen becomes small.

After five, six, or seven days the patient gets fever again with all the previous symptoms. This relapse is mild in many cases. People who develop jaundice, or who vomit blood during the first attack get the relapse in severe form. The jaundice is intensified, the secretion of urine becomes less, and more blood is vomited. The urine contains blood during the relapse. Even these cases recover splendidly provided they are not actively drugged. The people who pass blood are "bleeders" generally, or, as they say, their wounds take a long time to heal. The relapse is short, *i.e.*, it lasts for four or five days only, and the patients bear it better than the first attack. Rarely a third attack is noticed.

Out of 500 cases one case died of suppression of urine, two from exhaustion, one from meningitis, and two from heart failure.

Diagnosis.

A poor patient comes to a doctor with pains in the abdomen and calves, and with jaundice. History shows sudden accession of fever without shivering and occurrence of similar cases of fever in the neighbourhood.

This fever is not malaria, because quinine in very big doses has no effect and patients do not shiver.

It is not plague, because almost all patients recover, there are no buboes, and the fever is less.

It is not rheumatism, because the pain is in muscles and tendons, and salicylate and alkalies have no effect on its course, and there is no swelling of joints.

It is not typhoid, because the duration is only seven days; the characteristic headache and slow pulse are wanting; there is no diarrhœa. Chlorine mixture seems to do harm in this disease.

The diagnosis is very simple if microscopic examination of the blood is made.

Treatment.

The fever runs its course and defies all methods of treatment. The less active medicinal treatment you give these people the better.

Opium in pill form, pushed to produce pin-point pupil, does some good.

Quinine in 5 gr. doses keeps a check on the peculiar "air hunger" respirations. Patients getting quinine have better pulse than those taking diaphoretics. The motions are less coloured under quinine. The relapse is more marked in patients who take quinine during the first attack.

All antiseptics seem to do harm in this fever.

Diaphoretic treatment is exhausting.

Cold water baths are very beneficial. Still, under cold baths the tongue does not improve as it does in typhoid; but the "air hunger" respirations diminish. The urine is improved by baths.

Food consisting of fresh fruits, especially oranges in abundance, fresh milk, fresh mutton broth with plenty of salt, and green vegetables is the proper diet. Alcohol seems to do harm in this fever; even the worst cases recover without a drop of it.

Nothing active should be done for the jaundice. Fomenting over the liver for pain does harm Vomiting is not amenable to any treatment.

To check the relapse residence must be changed at once. Fruits, port wine and plenty of common salt help to render the relapse less severe.

THE ANATOMY OF THE BITING FLIES OF THE GENERA *STOMOXYS* AND *GLOSSINA*.

By Lieut.-Colonel G. M. Giles, I.M.S. (Rtd.).

(*Continued from p.* 202.)

The heart lies almost free in the pericardial cavity; but is, nevertheless, firmly supported by muscular bands, the alar muscles described by Prof. Minchin, but these seem to me quite distinct from the strong antero posterior muscle which forms a part of the pericardial septum, and which, to judge from his plate lxv. is the structure so named by Lowne in his book on the blow-fly.

This latter structure is well represented in both *Stomoxys* and *Glossina*, and does not appear to me to have any direct connection with the heart at all, and is certainly not the same as the structures referred to under that name by Prof. Minchin, which seem to have a much better claim to be so called. The muscle of the septum is a very well marked structure, broad in front and narrow behind, and is somewhat fan-shaped. The more internal fibres soon join with those of the opposite side under the first two chambers of the heart, while most of the rest extend the whole length of the septum, of which they form a considerable portion of the substance. The septum, is, however a very complex structure. It is lined with a distinct layer of pavement, endothelium (*vide* pl. i., fig. 12) and there are said to be pores in it, whereby the pericardium communicates with the general body cavity. Besides this there appears to me to be a delicate but perfectly regular layer of unstriated transverse fibres. Its lateral attachments to the terga are embedded in thick masses of the fat-body. The fat-body appears to correspond to the "cellular" tissue of vertebrates, and forms the packing of the organs not only about the septum but in every other waste space of the body. It is composed of enormous cells which appear to be usually multi-nucleate, but as a rule, it is not easy to distinguish the limitations of the component cells. The protoplasm (as shewn in pl. i., fig. 13), is vacuolated, the spaces, in specimens that have not been treated with solvent reagents, being occupied with a reserve store of nutriment.

Besides the structures already enumerated as entering into the formation of the pericardial septum, there are two distinct sorts of cell which have been indifferently referred to by authors as "pericardial cells." One category of these (pl. i., fig. 14) are undoubtedly nothing more than young mononuclear fat cells, their protoplasms having exactly the same structure as the cells of the fat body. The others are very different and are multipolar cells (pl. i. fig. 15), the poles of which, according to Lowne, are muscular fibres. These form a network over especially the lateral parts of the septum, and look exactly like ganglion cells, though it is not suggested that they are of that nature. In studying the literature of the subject it is well, however, to remember that either of the above forms of cell may be referred to by a writer, as the obvious discrepancies between their descriptions are otherwise very confusing.

As far as the writer can see, Lowne's theory that the dorsal vessel is a hollow muscular fibre is a quite accurate description of the thoracic aorta, as it seems to consist of a single row of long cells, the sides of which curve upwards to meet in the middle line above. The protoplasm, with the nuclei of these cells, forms a continuous thread in the middle of the ventral wall of the tube, lying in contact with the dorsal wall of the gut, while the lateral prolongations, which form the walls of the vessel, are extremely thin and delicate. The lumen of the tube is triangular with the apex dorsal and the flat base ventral, so that it fills up the interstice between the gut below and the lowest pair of great longitudinal thoracic muscles, and is padded on either side by rows of fat-cells.

The generative organs.—These in all Diptera, and in both sexes, consist essentially of a Y-shaped tube, the branches of which lead up to a tract of generative epithelium. Into the point of meeting of the arms of the Y, there enters, in each sex, a pair of accessory glands, so that it would be, perhaps, more exact to describe the agygos reproductive duct as dividing into four follicles; as morphologically it seems probable that the reproductive and their accessory glands may be of the same value. In the male these glands are usually spoken of as the vesiculæ seminalis, but the term is an entire misnomer, as they secrete a milky coagulate fluid which mixes with the semen in the common sperm duct, but never contain spermatozoa. Structurally they closely resemble the parovaria, or corresponding accessory glands of the female. In *Stomoxys*, however, the usual arrangement is considerably modified, as the paragonia only exist as separate lateral organs for a fairly short distance as a pair of diverticula and then unite to form a single tube which, for the greater part of its length, seems quite without convolution, and runs beside the ejaculatory duct to its point of union with the common sperm duct, which immediately after divides into three—the lateral branches or vasa differentia (efferentia of Lowne) looping backwards to the testes, while the median extension widens to form a rudimentary ejaculatory sac, which, however, has neither the muscular loops nor the fan-shaped sclerite which make it such a prominent organ in the blow-fly.

The ejaculatory duct is so small in comparison with the paragonium which lies beside it that it is very likely to be overlooked in dissecting, and the paragonium mistaken for it, as the latter is 0·15 mm. in diameter, while the ejaculatory duct is but 0·05. The duct, vasa differentia and ejaculatory sac are of exactly similar structure, being formed of a structureless intima, lined with conical epithelial cells, the apices of which project into the lumen so as to impart to it a ragged outline. The paragonium is a peculiar structure, as the lumen of the tube is surrounded by a trabecular structure, the interspaces of which are filled with a granular material. The trabeculæ radiate towards the lumen, and so have a superficial resemblance to columnar epithelium, but though I have stained them in various ways, and the lining of the ejaculatory duct lying close by has the nuclei of its epithelia quite distinct, I have never seen any structure in the granular substance which could be regarded as a nucleus, while the trabeculæ are distinctly nucleated, especially at their internodes. On this account I prefer to consider the granular substance as intercellular. The testes are two small bodies enclosed in a sac formed of flat, deeply pigmented epithelium. In mature insects it is almost entirely filled with spermatozoa of enormous length, but in young insects trabeculæ of father cells project into the interior, and there may be but little ripe sperm.

The stages of the spermatogenesis seem to be quite normal and have been described *ad nauseam* by many writers. All these structures are imbedded in a dense mass of fat-body, and in front lie beside the rectum. A rather complicated system of muscles come into view in the hindmost sections of a series which actuate the rather complicated external genitalia. For most of their course the ejaculatory duct and paragonium run rather above the longitudinal axis of the insect, but as they approach the hypopygium bend sharply down to the venter.

The female generative organs are quite of the usual dipterous type, each insect producing in the course of a season an immense number of large oval eggs.

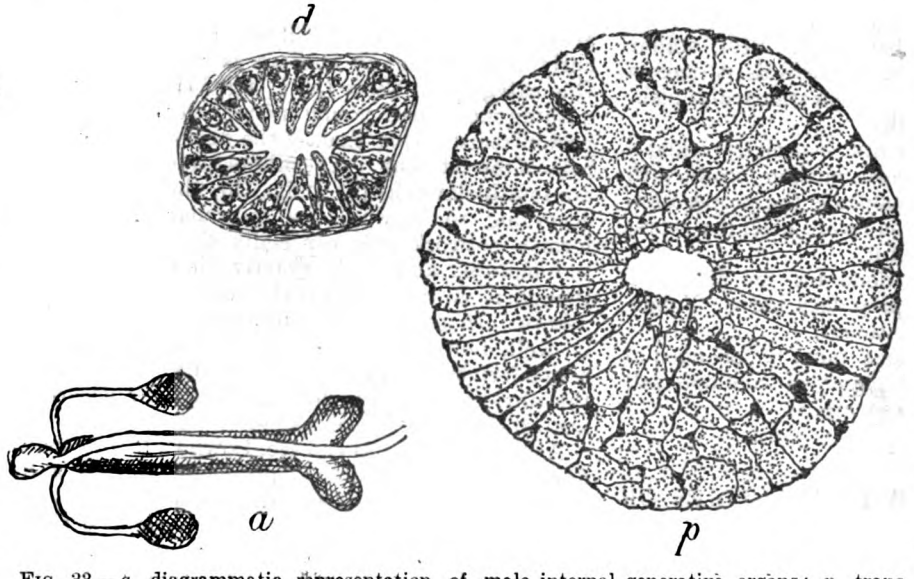

FIG. 33.—*a*, diagrammatic representation of male internal generative organs; *p*, transverse section, paragonium; and, *d*, transverse section, ductus ejaculatorius, × 400 diams.

These eggs during their development lie more or less in rows of about four ova of various stages, and it is usual to speak of these rows as "ovarioles," but the cavity containing each ovule is just as separate from the more and less developed ovules below and above it respectively, as it is from those of similar development surrounding it, and the separation in both cases consists of an open stroma of muscular fibres without any definite intima or epithelial lining, so that fundamentally their structure is the same as that of the mammalian ovary with which human anatomists are familiar. The general arrangement and relations of the ovaries may be gathered from the following figure, which includes also a diagram of the ovipositor copied from Lieut. Tulloch's paper.

The lateral oviducts, too, cannot be said to expand into a funnel-shaped receptacle receiving the ovarioles, as it seems rather a portion of the general body cavity into which the branches open, which latter receive the

ovules after the dehiscence of the muscular alveoli in which they lie, and to which they are guided by a continuity of the muscular structure of the ovary with that of the wall of the oviduct.

The smallest germ cells are multinucleate masses surrounded by a capsule of small cells. The next larger form (*b*) has two nuclei, and spring from a small celled mass on one side, while on the other the capsule is lined with large columnar epithelium, from which is developed the chorion which forms the shell of the full grown ovule (*c*). In the less mature eggs the chorion is still recognisable as a lining of flat cells (*d*) within the shell, but in those ready to pass into the oviduct it is difficult to distinguish this membrane. In ovaries in a certain stage of development before the chorion has changed into egg-shell, it is easy to mistake it for an epithelial lining of the ovariole. The eggs (*c*) are elongated ovoids having at their upper end an infolding of shell and chorion which leads to a minute canal, the microphyle, passing to the interior of the ovum to give passage to the sperm cells of the male. The stroma separating the ovarioles consists of elongated spindle cells containing each a row of nuclei. In (*e*) these muscle cells are represented in the inter spaces between three contiguous ovules. Under a high power it can be made out that the egg-shell is fibrillated, or striated vertically to its surface. Towards the end of the common oviduct there opens into it the two accessory glands (parovaria), and the ducts of the three spernothecæ.

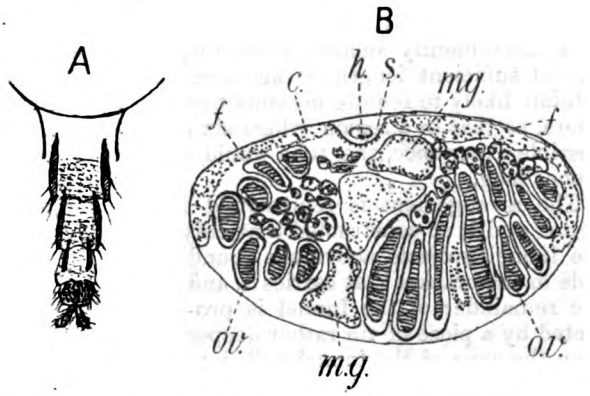

FIG. 34.—A, diagram of ovipositor, after Tulloch; B, transverse section of abdomen of gravid female; *c*, crop; *f*, fat-body; *h*, heart; *mg*, mid-gut, × 28; *ov*, ovules; *s*, pericardial septum, × 20.

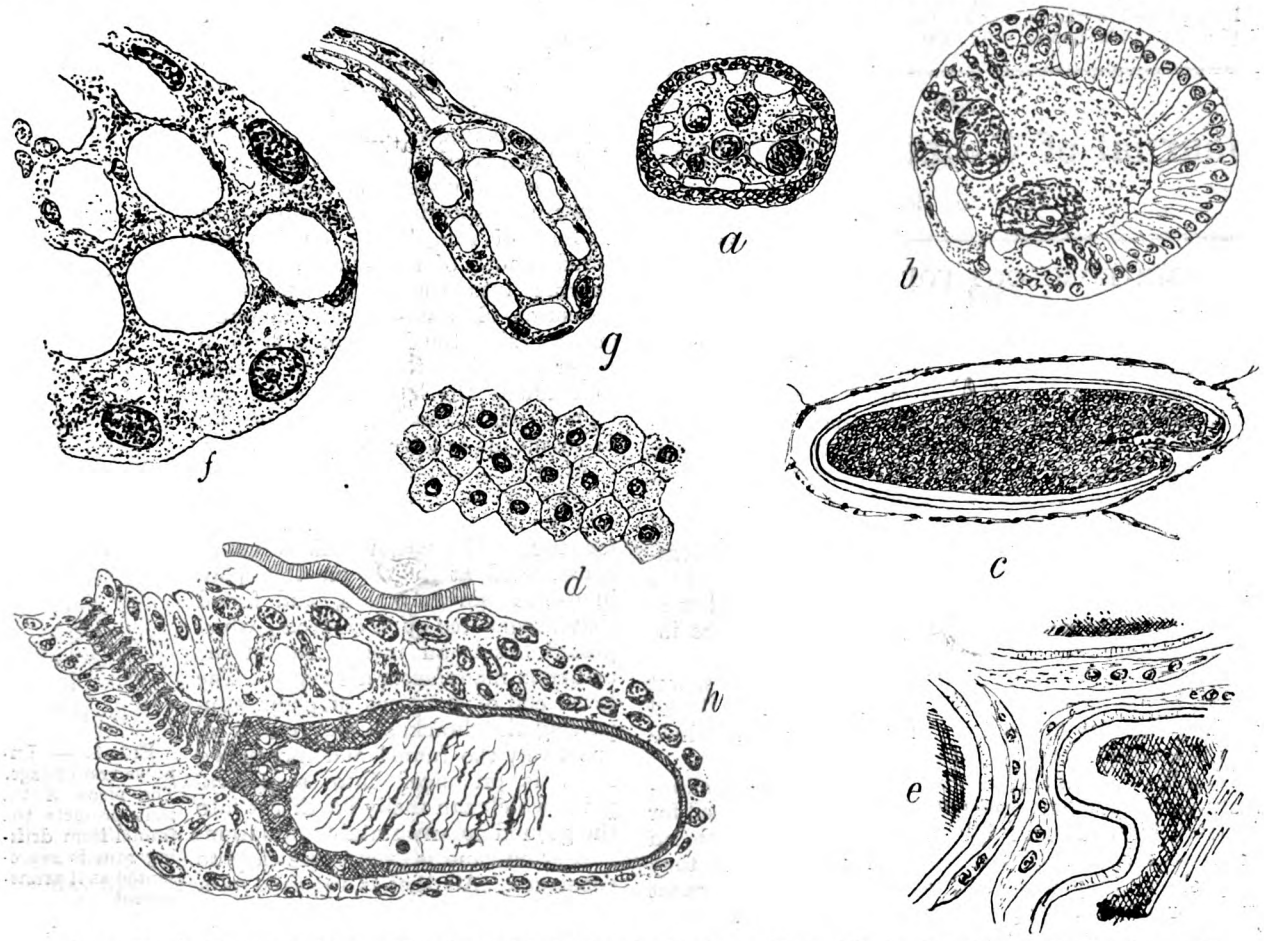

PLATE II.—*a*, Young ovariole, × 270; *b*, ovariole further developed, × 270; *c*, fully developed egg in its alveolus, × 50; *d*, portion of chorion or lining membrane of egg shell, × 270; *e*, muscular stroma separating three ovarioles, × 270; *f*, portion of parovarium, × 540; *g*, the same and its duct, × 270; *h*, section of one of the vesiculæ seminalis, × 540.

(To be continued.)

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THE

Journal of Tropical Medicine

JULY 16, 1906.

METEOROLOGY FOR AMATEURS.

INSISTENCE and repetition can never be fairly deprecated in a good cause, and hence we have no hesitation in returning to our contention that an immense amount of good work might be accomplished by Europeans whose business takes them to out-of-the-way parts of the world which, though fairly known from the point of view of the traveller, are as yet quite unexplored regions to the meteorologist.

The subject forms a most interesting hobby, and can be pursued at so small a cost that the consideration of expense need hardly be a bar to anyone, as a set of thermometers, a rain gauge, and a wind-vane are all that are really necessary to afford all the information essential to a preliminary survey.

A set of maximum and minimum thermometers, wet and dry bulb of each, can be got for under £2,[1] and a rain gauge for about 15s. more, so that the whole cost of a reliable outfit need not exceed £3.

Maximum and minimum thermometers, manufactured for popular use, can, however, be obtained for a few shillings, and by comparing these with an accurate instrument, and tabulating any errors they may show, they are easily available for more exact work, or a corrected paper scale may be pasted over that furnished with the instruments.

[1] A set of such instruments were supplied to the writer by Gallenhamp and Co., for £1 18s. 8d.

All that is necessary is to plunge each instrument along with a standard thermometer into water warmed to near the highest point of their scales, and to take simultaneous readings as the water cools.

A rain gauge may be improvised by utilising a large glass funnel for the purpose, and mounting it on a bracket, so that its tube discharges into a glass tube of a conveniently smaller diameter, say about $\frac{1}{5}$th, and of sufficient length to accommodate the largest rainfall likely to require measurement in twenty-four hours, so that in a region where six inches of rain is a possible experience the tube would require to be 30 inches long.

The arrangement is represented in the subjoined figure, and is so constructed that only the bare edge of the funnel projects above the round hole in the bracket that carries it, and the remainder of the funnel is protected by a piece of tin rather deeper than the cone of the funnel nailed to the edge of the bracket.

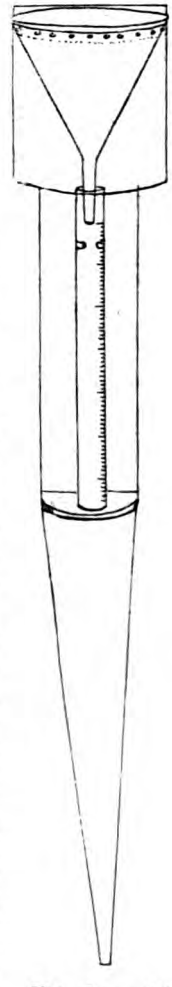

FIG. 1. — Improved rain guage. The piece of tin that protects the funnel from drifting rain is represented as if transparent.

This is necessary to prevent driving rain from striking the outside of the funnel and running down its surface into the measuring tube, which latter stands in a small hole in a lower bracket, while its upper end is held by a small brass spring clip, so that it can easily be slipped out of its supports to empty it.

Remembering the familiar formulæ that the area of a circle is πr_2, it is easy to calculate the volume of water corresponding to one-tenth of an inch of rain falling on the exposed mouth of the funnel, and by pouring into the tube successive measures of water of this amount, and marking the level on a strip of paper pasted to the tube, it is easy to graduate the latter to tenths and inches, while the cents can be put in by means of a proportional divider.

After graduation the paper should receive two or three coats of varnish, and the apparatus will then be ready for use. The writer had a gauge constructed at home on this plan in use for several years, and found that it registered quite correctly when placed beside an instrument of the orthodox manufacturer's type. The lower end of the piece of plank supporting the brackets that carry respectively the funnel and measuring tube, is prolonged into a conical point which can easily be thrust into the ground in any suitable situation.

A wind-vane is even more easy to construct. All that is required is a vertical rectangular loop of stout brass wire, the arms of which are bent to form horizontal eyes, through which is threaded a somewhat stouter wire which is fixed into the end of a pole long enough to elevate the vane above any neighbouring

obstacles, as in fig. 2. To the vertical piece of the loop is sewn a small pennon or burgee, and the points of the compass should be indicated by pegs driven into the ground around the base of the pole. In recording, it should be remembered that the burgee will point in the direction opposite that from which the wind is coming.

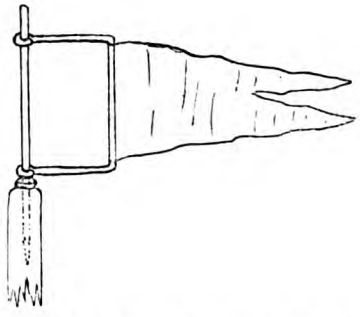

FIG. 2.—Improved wind vane mounted on a pole.

The thermometers should be mounted on a board nailed at the level of the observer's eye to the middle pole of a small mushroom-shaped thatched hut, supported on poles about 5 feet high, but quite open at the sides; and if this be made to cover a sufficient area, requires no "screen," though it is desirable to have one, especially in dusty localities, in order to protect the muslin enveloping the wet bulbs.

That no special scientific training is needed for the pursuit is shown by the fact that excellent work is done in India and other parts of the world by natives boasting of but little education, and the time that need be devoted to it is very small, as, with the system advocated in a previous article, of a single daily observation of maximum and minimum wet and dry thermometers, punctuality of observation is by no means essential, as the observation may be taken "then or thereabouts" at any convenient time of the day.

We would commend these brief notes on this subject especially to the graduates of the Livingstone College, for no body of men penetrate further beyond the bounds of civilisation; and being usually fairly stationary, they are better situated for work of the sort than are Government officials, who are usually moved too frequently from place to place to make continuous observation possible; but commercial men are sometimes equally well placed, and would, we venture to think, find an interesting relaxation from the worries of trade in wild parts of the world, by contributing to our scientific knowledge of their places of residence on this highly important subject.

LIVINGSTONE COLLEGE.

COMMEMORATION day was celebrated by a meeting in the grounds of Livingstone College, on Thursday, May 31st, Mr J. A. Simon, M.P., in the chair.

The Principal, Dr. C. F. Harford, read a brief statement with reference to the progress of the College.

In the course of his remarks, Mr. Simon said: We are, unfortunately, in this country, at this moment in a controversy about some branches of education—a subject beyond all doubt controversial, and it is therefore a great satisfaction—I hope I may say to all of us—to find that in coming here we meet, not only on common ground in the sense that we are in the spacious grounds belonging to this place, but we meet on the common ground of a common belief in the worthiness of the object, and the excellence of the method by which that object is being carried out in this place. I am sure it is a satisfaction to feel that there are still some important matters of educational life on which we can all agree.

As I understand it, this place does not claim to turn out medical missionaries, but it holds that no man or woman can serve in that high and noble office unless he or she has a knowledge of things medical such as make a part of a good education in those who are determined to learn what they should know. It seems an extraordinary thing that a man or woman, though this institution is as yet confined to men, that a man or a woman who is prepared to devote his or her life to this high calling, with no thought of drawing back in the face of danger, should go out to places, far away it may be from medical aid and from protections from disease, without such protection as a place of this kind can afford. It strikes one as startling that, as we have been told by the Principal just now, though this place has been doing its work well for many years, the great service which it could do to a large body of men and women going to the mission field is not taken advantage of by the great missionary societies to the extent one would expect. As I understand it, the people who come to this place come here primarily in order to learn how to protect their own lives and the lives of those nearest and dearest to them in the work they have undertaken, and the man who does not do that is as bad as the man who does not insure his life when he is going to be married.

I feel certain I am expressing what is in the mind of you all when I say that work such as is done here is work in which we may claim Livingstone's spirit is amongst us, and in commemorating on this day the good work of Livingstone College during the past year we are preserving and maintaining the tradition which that good man and that well-trained doctor, combined with such magnificent effect and example for all time in Africa.

Mr. James Cantlie, F.R.C.S., said: It is now thirteen years since Livingstone College was founded, and some 250 students have passed through its portals during these years, and gone into the mission field better equipped for their work than they otherwise would have been. Alas, only 250 students in thirteen years; and when we consider how many thousands of missionaries have been sent out from this country, it is evident that only a handful have been trained here. We all admire missionaries, we all esteem the man who has devoted his life to the cause of Christianity, and his efforts, it is hoped, will go on as long as our race retains its virility. The missionary takes his life in his hand when he goes forth to do his work, and comes back, perhaps, with his health shattered, or perhaps he dies at his post. For the missionary to die for Christianity is a noble end, but there is still a nobler aim—he might live for Christianity, and this College exists for the purpose of

teaching men how to live for Christianity. The work which is carried on at Livingstone College I think most of you know, it is not you who have to be told, it is the stranger without the gates. I feel rather in the position of a clergyman lecturing his congregation to be regular in their attendance at church and to be liberal in their giving; it is not to them he ought to talk about not coming to church, it is the people who do not go to church he should upbraid and remonstrate with for their niggardliness in giving. The work that is being done at Livingstone College is this: Missionaries who have gone through a course of theology for three or four years come to this College for nine months—they often come for a much shorter time—but some come for nine months, and they come to get instruction in elementary medicine, surgery, and hygiene. It really should be called by a term which is familiar to you all, "first aid" in medicine, surgery, and hygiene You are all familar, or ought to be, with how to render first aid to the injured; many of you have, no doubt, been through the St. John Ambulance first aid course. What were you taught? You were taught elementary anatomy and surgery. Some say you were taught a little knowledge, and a little knowledge is said to be a dangerous thing, but the instruction you were given was complete and exhaustive of its kind. It is a distinct branch of surgery and medicine, and therefore do not go away with the idea it only teaches you "a little knowledge," for it completely fulfils its purpose. A course of the kind would not be of direct use to you were you required to render first aid to persons suffering from disease in the tropics. Here in Britain, in our factories and workshops we find accidents are part and parcel of our daily life; street accidents occur every day. When one goes to the tropics, one finds that there are, in many places, no horses, no vehicles—if you go to South China, for instance, there are no railways, no factories, no horse vehicles, everything is carried on men's shoulders, so that there are no "accidents" such as we meet with here, and therefore it is not sufficient to be trained in merely "first aid" work which we require at home; it is not the kind of first aid that is essential there. What is required of a missionary in warm climates is to know how to deal with the sudden onset of diseases, which destroy life almost as suddenly as a railway engine may in this country. The disease comes suddenly, its course is short, and the patient may die, it may be, in a few hours. It is to teach men how to render first aid in some of the terrible maladies of the tropics that is the aim and object of Livingstone College, and it is necessary for missionaries to know something of this branch of medicine. Most clearly is it necessary, for the missionary is often looked upon by the natives as a "medicine" man, the reason being that most of the white men who first appeared as missionaries had a knowledge of medicine. Livingstone is responsible for that in Africa; his reputation as a medical man was great, and when the people saw him they knew he was capable and willing to administer relief to the suffering. Now when we send out our missionary he is looked upon as one who knows something of medicine, in the first place, from the very fact that he is a white man; and in the second place, seeing also that he is a learned man and religious, he is believed to possess the attributes all natives are accustomed to associate with religious teachers, namely, the power of healing.

What is Required of the Missionary.

A hundred years ago the priest or minister in this country was sought after by people in illness, and it was frequently part and parcel of the work of the clergy to administer to the body as well as to the soul. The same idea prevails throughout the length and breadth of Asia, Africa, and many parts of America today; the missionary is looked upon as a "medicine" man, and therefore how very necessary it is that the missionary should have a knowledge of the healing art. In the earliest days of Christianity we know the part, the vital part, the cure of disease played, and amongst the more primitive peoples of the world today the same part is expected of us. Any one familiar with the terrible epidemics which afflict humanity in tropical countries, with the suddeness of the attack and the fatal nature of many of the diseases, can well understand the desire of the natives to be saved and protected from the virulence of their scourges. This prayer of the natives for relief from suffering and from the illnesses which at times almost annihilate their tribes is a natural, a human cry, and it becomes us to treat it humanely. To these plague-stricken peoples we send in our charity missionaries; men and women anxious and willing to devote their whole time and even their lives to benefit the souls of our unenlightened fellow-beings. A noble object, and one worthy of our support, but there are means by which this excellent work can be more efficiently carried out than it is at present, and it is to provide these means that Livingstone College was called into being. Health is the handmaid of religion, and the Saxon word "heilig," which we translate "healthy," might be as correctly transcribed "holiness." The missionary sent out with no medical training is not to be envied. He may find the people around him dying of ailments which, for lack of even elementary knowledge, he can do nothing to alleviate. He can have, owing to want of instruction, no confidence in himself, and therefore cannot inspire confidence in others. The effect of such a position upon the mind or conscience of the missionary it is not pleasant to contemplate; in the name of common humanity he does his best, but his best is unskilled labour, because he is untrained, and the situation comes home to him with heartfelt regrets that he was sent out, or, that he elected to come out from home, ignorant of even the elements of medicine or surgery. Who is to blame if the missionary is sent out thus imperfectly equipped? Not the young man or woman who in the enthusiasm for the teaching of Christianity volunteered for the foreign field. The societies to whom we entrust our mission work are willing to take advantage of the enthusiasm of these young men and women, and all too frequently send them out imperfectly equipped, send them to their death in many cases because their religious fervour was not tempered with practical wisdom. The recruiting ground for missionaries is not illimitable; we are drawing upon our population in many directions for the sake of empire, and with the advance of time and opportunity more and more mis-

sionaries will be required for mission work; it behoves us, therefore, to conserve our voluntary workers in the good cause, and to see to it that their lives are not needlessly thrown away.

"Do the Missionary Societies fulfil their Duties?"

Now, all this work cannot be carried on without money. Many millions are contributed yearly by the people of Britain for the missionary cause, and as Christianity spreads in heathen lands yet more will be required. The immense sums of money we contribute are greatly to the credit of the people of this country, and more will no doubt be forthcoming as it is required. The moneys we contribute are paid into the exchequer of the several missionary organisations, and to them we look to see that this money is rightly spent. Let me say at once that the missionary societies which send out their missionaries without granting them the opportunities of—nay, insisting upon—learning something of medicine; surgery and hygiene are not fulfilling their trust. They are juggling with the lives of men and women in a manner which, did the people in this country appreciate it, would lead many charitable persons to close their purses with a snap, and to say, "I will contribute no more until you mend your ways." I should like my words to reach the ears of all the authorities of these societies, as well as those of the public who contribute the money. It is difficult to do that, however, by speaking or writing mere platitudes; it will require a "scene" of some kind before the public can be aroused to the situation; it would require someone in church, when on the next occasion money is being asked for missionary societies, to stand up before the collection is made, and to say, "Sir, are the missionaries you intend to send out, with the money we are willing to contribute, to be properly equipped for their work by being trained in elementary medicine and surgery? because if not we will take no part in encouraging these estimable men and women to go to their death." Could someone be found to have the courage to do this the matter would be settled for ever; no money would be forthcoming to societies who betrayed the confidence the public place in their work and methods. Surely this very humane work can be done without some such vulgar appeal to unruly sentiment. Surely it is not necessary to have scenes in church to rouse the public conscience in regard to the lives of missionaries. The missionary societies are not so numerous but that they cannot be appealed to individually; and, although we are told a committee has no conscience, the men on these committees are sensible Christian men, and the fact that they are dealing with the lives of men and women must surely come home to them.

Livingstone College the European Centre for Training Missionaries in Elementary Medicine.

I have spoken strongly on this subject because I feel strongly; and had I more power to deal with the matter I should not rest until I had made it compulsory by law that no missionary leaves these shores for work in the tropics until he can satisfy the charitable public that he is properly equipped for the task. The lives of the missionaries are as much a national asset as the lives of the men who go into the public services or join commercial firms; and just as government servants and merchants are necessary for our imperial wants, so are missionaries necessary to fulfil the desires of the people of this country that religious teaching shall be given to the heathen!

Attempts at teaching some elements of hygiene are made elsewhere than at Livingstone College, but at this college alone is a systematic course given which is calculated in any way to meet the objects in view. As usual, we are slow in this country to entertain or to act upon a new idea; not so some of our Continental neighbours, and several of the western European nations send their missionaries to be trained at Livingstone College.

Do not be Impatient when the Natives Hesitate to Ask your Advice.

I would like to give a word of warning to young missionaries. Do not be disappointed if you find the natives inclined to "stand off" at first. You may think it ungrateful of them not to trust you at once and to be unwilling to place their lives in your hands. Here in England we do the same thing, we stand off a bit, to see what the new doctor is like, and so you cannot blame these people if they do not throw themselves at once into a recently-arrived doctor's hands. But when you gain their confidence the "medicine" man is to the natives supreme. I remember in Egypt during the cholera expedition of 1883, when I happened to be one of the men who volunteered for service, I went to a village where I was told there were numbers of people dying, but I could find no cases. I searched about for two or three days, but could not find any evidence of cholera, and I telegraphed to the authorities in Cairo "I am sorry"—I should have said, I suppose, I was glad—"I am sorry, but there are no cholera cases here." At last one of the Egyptian soldiers who accompanied me in my rounds began to trust me, and he took me to a house where he knew there was a case of cholera. I went with him to the door, and there was the mother of the lad who was said to be ill with cholera, standing at the door, and declaring there was no case of cholera in the house. We pushed past her, and we searched everywhere for that patient. It was not a large house, we soon went all over it, but there was no sign of a patient. At last under some hay in front of the buffalo I saw something move, and gathering up the hay I found the sick lad. The patient recovered, and then I began to get cholera patients in scores. Within twenty-four hours I had 200 patients. The people thought that the British Government intended to punish them; we had been at war with them in 1882, and they thought we were sent out in 1883 to complete the destruction of the country and the people. That was the light in which the doctors were looked upon, and one can scarcely wonder at the backwardness of the people to accept our services.

Again, do not be too ready to come to the conclusion that there is no such thing as some particular disease in a district because you have not seen it. You may say to yourself:—"I cannot find any of these diseases I was taught so much about at Livingstone

isolated by other workers. Detailed bacteriological work and experiments proved, however, that such micro-organisms have nothing to do with the production of the disease, and in the light of our present micro-biological knowledge must be regarded as extraneous organisms isolated and fully described by investigators using somewhat defective technique. The bacteriological examination of Wright's so-called primary lesion, *i.e.*, damaged gastro-duodenal mucosa resulted in the isolation of many rod-shaped bacteria, the biology of which showed them to be nothing more or less than ordinary intestinal micro-organisms. In summing up our bacteriological results, our investigations strongly point to the conclusion that *beri-beri is not due to any micro-organism of the hitherto described types.* Indeed *we doubt if the disease is an acute specific infectious disorder.* So far our results are against its being so.

Animals not liable to the disease.—Coming to the experimental part of the report, the results of our attempts to induce the disease in any of the common domestic animals are decidedly a failure. In no single instance, out of over fifty miscellaneous experiments upon monkeys, pigs, calves, sheep, fowls, rabbits, &c., were we able to call forth even the shadow of a symtom or sign of beri-beri.

Comparing the results of these experiments with the series carried out by Durham, who also had negative results, it would appear that it is impossible to convey beri-beri directly from man to animals. So far as published records are concerned, monkeys are the only animals which appear to have contracted the disease, and then only under natural conditions. These—the experiments of Hamilton Wright and published in a recent number of "Brain"—however, are isolated observations, and judging from the recent remarks of Durham in the *Journal of Hygiene* some doubt would appear to exist as to the real condition of the monkeys described by Wright as suffering from beri-beri.

The question as to whether any animal can contract beri-beri direct from man, or indirectly through some other channel, must remain open. Our own opinion is decidedly against the conveyance from man to animals. With the exception of Hamilton Wright's experiments, which must be received with due caution, *there are no reliable records of beri-beri in animals.* Indeed it would be difficult to experiment along these lines with hope of success in the absence of the etiological factor and its point of invasion of the body.

Our experimental researches bring us further along the line of our conclusions as to the non-micro-organismal nature of beri-beri. Up to the present time none of our researches have guided us to form a conclusion that it is a specific infectious disease. Indeed all the evidence contained in this report is against such a conclusion.

The premises upon which we built up such a statement so antagonistic to the theories of Hamilton Wright are the following:—

(*a*) There is no evidence of a primary lesion, *i.e.*, a point of invasion of the virus into the body. This, however, carries with it very little weight, as many specific infectious diseases have a somewhat cryptogenous point of entry into the human tissues.

(*b*) No specific micro-organisms can be found in any organ or tissue of any case of beri-beri which can be brought into close causal relationship with the disease. The micro-organisms found in Wright's so-called primary gastro-duodenitis are to be regarded as ordinary bacteria belonging to the intestinal flora.

(*c*) Experimental researches are negative. The blood contains no organisms, and the transference of large quantities of beri-beri blood to the tissues of healthy animals never induces disease.

Similar results are obtainable with the spleen, liver, brain, &c.

When we come to the gastro duodenal mucosa as found in acute and rapidly fatal cases of beri-beri, and use an emulsion of this for feeding monkeys—animals said by Wright to contract beri-beri naturally—and obtain uniformly negative results, our faith becomes somewhat shaken in the micro-organismal nature or the specific infectivity of beri-beri.

In conclusion, the results of our researches are directly opposed to those of Hamilton Wright, and in more or less harmony with those of Durham.

Of late years a considerable diversity of opinion would appear to prevail as to the isolation of beriberics and the treatment of beri-beri cadavers. From our researches we can see no valid reason to suppose that in beri-beri we are dealing with a highly infectious disease. Indeed beyond the removal of such patients to surroundings light and airy, with the regulation of a liberal and wholesale diet, nothing more would be required to add to the sum total of the necessary sanitation.

As regards the burial of beri-berics, this, in our opinion, is of no vast importance apart from the question of the decomposition of the body. If provision during burial is made for rapid decomposition, as now laid down by all hygienists, no danger will accrue.

Having summed up the results of our investigations into this interesting disease it but remains to speculate on a theory as to its etiology. In these days everyone strives to have a theory in regard to the etiology of a disease like beri-beri. Whether such a course is advisable, in the absence of any definite data, we leave open for speculation.

Reviews.

MEDITERRANEAN FEVER IN INDIA: "Scientific Memoirs." By Officers of the Medical and Sanitary Departments of the Government of India. "Mediterranean Fever in India: Isolation of the Micrococcus Melitensis," By Captain George Lamb, M.D., I.M.S., and Assistant-Surgeon M. Kesava Pai, M.B., C.M. (Madras). New Series. No. 22. Price 10 annas, or 1s.

Captain Lamb and Assistant-Surgeon Pai have succeeded in establishing the fact that Mediterranean fever is met with amongst residents or natives of India. In eleven of the cases the *M. melitensis* was isolated from the spleen during life. Nine of the patients were Sepoys of the 27th Punjabis, Multan; one was a Sepoy of the 12th Sikhs, Ferozepore; and

Back Row: A. Reid (Junior House Surgeon), W. Smith Allan, A. Ingram, H. L. Deck, Mr. H. C. Staniland Smith, A. B. Tighe, Capt. E. L. Perry, I.M.S., E. Robledo, G. B. Warren (Laboratory Assistant), L. A Prins, B. M. Flood.

3rd Row: Dr. C. W. Daniels (Medical Superintendent), J. Ottley (Staff Surgeon, R.N.), A. E. Ridsdale, W. M. Wade, Capt. L. P. Stephen, I.M.S., Capt. F. N. White, I.M.S., J. J. Zellweger, J. McW. Bourke, J. P. Ziervogel, Capt. A. W. Cook Young, I.M.S., B. M. McVail (Senior House Surgeon), Capt. L. L. G. Thorpe, R.A.M.C., R. T. Booth, J. Cross, G. Portioli-Rocca.

2nd Row: A. T. Stanton (Demonstrator), Dr. F. E. Fremantle (Lecturer), Dr. B. S. Postwalla, Miss Dinbai Furdoonji Petit, Mr. Jehanjir Bomanjee Petit, Mrs. Manekbai Bomanjee Petit, Sir Patrick Manson, K.C.M.G. (Lecturer), Mrs. Goolbai Bomanjee Petit, Sir Francis Lovell, C.M.G. (Dean), The Hon. Bomanjee Dinshaw Petit, Dr. F. M. Sandwith (Lecturer), Mr. P. Michelli (Secretary), Miss K. Wyss, Miss L. G. Thacker.

Front Row: Major E. Wilkinson, I.M.S., H. W. Kirby, H. P. Kennard, E. N. Graham.

Absent—E. C. Peake.

LONDON SCHOOL OF TROPICAL MEDICINE.

21st Session. May-July, 1906.

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one was a man, also from Ferozepore, ten years resident in India.

In six of the cases no splenic puncture was made, the diagnosis resting solely on the clinical history and the serum agglutination reaction. Two of the cases were Sepoys in the 27th Punjabis, Multan; one was a prisoner in the Ferozepore jail; two, a man and a woman, resident in Lahore; one a native of Murree. There was found to be a great difference in the agglutination value of the sera in the different cases. The *M. melitensis* was isolated from the spleen at various stages of the disease, in most instances whilst the temperature was still high and the illness more or less acute.

Although many of the cases occurred in the same regiment, careful investigation failed to bring forth any evidence in support of common infection. The men belonged to different companies, to different races, slept in different barracks, and practically never met. The 27th Punjabis, in which regiment the majority of cases of Mediterranean fever occurred, were stationed at Multan since January 29th, 1905; previously the regiment were quartered at Ferozepore, also in the Punjab, and many cases of a kind resembling Mediterranean fever had occurred in the regiment before leaving Ferozepore for Multan. The 15th Sikhs succeeded the 27th Punjabis at Ferozepore, and one man of the former regiment developed Mediterranean fever at Ferozepore. This, however, seems to have been the only case, so that the infection left behind by the 27th Punjabis cannot have been severe. The explanation of the 15th Sikhs escaping the disease so markedly is believed to be due to the fact that over two months elapsed between the arrival of one regiment and the departure of the other.

A Vocabulary of Malay Medical Terms. By P. N. Gerrard, B A., B.Ch., M.D. (Dublin). D.T.M.H. Cambridge. Singapore: Kelly and Walsh, 1905. Pp. 107.

This useful book is well adapted for the purpose for which it was written. In addition to the vocabulary one finds valuable information in the preface. In the appendix will be found sentences for conversational purposes applicable to obtaining the clinical histories of such ailments as beri-beri, venereal diseases, fevers, cases of consumption and of dysentery. Snellen's Vision Test types, adapted to Malay requirements, form a useful practical addition to the vocabulary.

Correspondence.

To the Editors of the Journal of Tropical Medicine.

Sirs,—In Lieut.-Colonel Giles' article on "Biting Flies," in your issue of April 2nd, he quotes the old French saying "les mouches d'automne pignoient" as probably referring to members of the genus *Stomoxys*, and not to the common house-fly. Under certain weather conditions, however, I have on several occasions—both in South Australia and in Scotland—experienced a slight but irritating "bite" from the latter. The climatic conditions under which this happens are dull autumn days, when summer is just passing into winter and the housewife is in doubt about laying fires. The species is unquestionably the common house-fly, but how it produces the faint sting I cannot say. Surely it is this occasional occurrence to which the French refer.

Yours, &c.,

Perth, W. Australia. J. Burton Cleland.
June 9th, 1906.

With reference to the above it may be remarked that although the ordinary method of taking food, in the house-fly and its allies, is by means of a sort of licking action performed by the lobes of its so called "tongue"; these insects are nevertheless provided with a short pointed labrum and a hypopharynx hidden above the roots of the former. Though hardly suited for actual piercing, these would be quite capable of giving the slight prick occasionally inflicted by the common fly, which, however, probably only does so accidentally in its effort to obtain as much as possible of the perspiration of the person on which it has settled. Admitting this, however, I believe that *Stomoxys* is far more commonly the real culprit.

Personal Notes.

Indian Medical Service.

India Office: Arrivals of Indian Medical Officers in London.—Captain R. E. Lloyd, Captain R. M. Dalziell, Captain R. M. Carter, Major J. B. Smith.

Extensions of Leave.—Lieutenant-Colonel W. S. Eyres, 6 m. Med. Cert.; Captain R. M. Dalziell, 3 m., Med. Cert.

Permitted to Return to Duty.—Captain E. C. Maddoch, Major J. K. Close, Lieutenant R. F. Steel.

Postings.

Captain A. G. Sargent and Captain W. H. Cagaly, services lent to Government of Bombay.

Major Grayfoot, to be Med. Officer, Sind Rifles.

Colonel Benson officiates as Surgeon-General, Madras, with temporary rank.

Major Anderson, Civil Surgeon, Tippera.

Assistant-Surgeon Daley acts as Civil Surgeon, Balasore.

Lieutenant-Colonel G. H. Bull officiates as P.M.O., Bombay.

Major E. R. Parry acts in additional charge as Civil Surgeon, Dacca.

Captain Mathew, services lent to Government of Burmah.

Major A. R. S. Anderson, services placed at disposal of Government, East Bengal and Assam.

Lieutenant-Colonel Dennys officiates as Agency Surgeon and Admin. M. O., N.W. Frontier Province.

Captain Flening, I.M.S., Civil Surgeon, Peshawar.

Major Bidie, Captain Feslir, and Captain O'Neill, services placed at disposal of Government of Madras.

Colonel D. ffrench Mullen, services temporarily placed at disposal of Commander-in-Chief.

Leave.

Major P. P. Kilkelly, Privilege and Study, 1 y.

Lieutenant-Colonel R. N. Campbell, privilege leave, 2 m. 28 d.

Mr. Gibson, Assistant Director, Plague Research Laboratory, Bombay; leave, 2 y.

Captain N. Collinson, leave on Med. Cert., in anticipation of formal sanction.

Dr. P. A. Rigby, Civil Surgeon, Balasore, combined leave, 6 m.

Notes and News.

Punjab Medical College Affair.—Over a hundred students of the medical school at Lahore, who were out "on strike," have come in and made submission. About 164 others, including the ringleaders, still stand out.—*Pioneer Mail*, June 15th.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Bulletin de L'Institut Pasteur," June 15, 1906.

"The Serotherapeutics of Plague" (La Sérothérapic de la Peste), by Dr. Edward Dujardin-Beaumetz.

As soon as ever Yersin discovered the pathogenic agent of bubonic plague in the epidemic which was raging in Hongkong in 1894, he sent specimens of this microbe to the Pasteur Institute, where Roux and his colleagues, Calmette and Borel, made vaccination experiments. By using cultures killed by heating to a temperature of 60° C., they succeeded in vaccinating animals, and proved that their serum possessed preventive and curative properties in experimental plague infection, since when horses have been immunised to supply the necessary serum for the treatment of human plague. The process consists in intravenous injections into the jugular veins of the horses, first of emulsions of microbes killed by heat, and afterwards of living microbes which have been rendered hypervirulent by passage through guinea-pigs and rats. The process is a somewhat lengthy one, as it takes from five to six months, for the vaccinations have to be repeated weekly and in progressive doses before an antitoxic and antimicrobic serum can be obtained which—after due experiments on animals—can be used for human serotherapeusis.

The test used at the Pasteur Institute for the dosing of the anti-plague serum consists in inoculating a mouse with plague, and sixteen hours later injecting it with $\frac{1}{10}$th of a cubic centimetre of serum. The recovery of the mouse testifies to the sufficiency of the activity of the serum. In man, the efficacy of an anti-plague serum as a preventive measure has been fully proved, but the effect is only a transient one, and passes away after a period of about ten days, so that a fresh injection of the serum is then again necessary to keep up immunity. If the focus of the epidemic is a restricted one, these injections are of great service; but serotherapeusis as a preventive measure is out of the question in a country where plague is endemic. In this latter case recourse must be had to the injections of microbic emulsion killed by heat, after the method recommended by Haffkine. In this case immunity is acquired more slowly, but, on the other hand, it lasts longer, and may even persist for several months.

A lengthy list of the world-wide series of vaccinations undertaken up to date is now given, with their several results, and with their varying success. The difference is accounted for as follows:—The anti-plague serum was given too late; in insufficient doses; only rarely by the intravenous method; and lastly, the serotherapeutic treatment was suddenly stopped as soon as the high temperature fell.

As far back as 1898, Simond noticed that among the Hindoos treated, those who received the serum on the first day of the disease had a mortality of 20 per cent. only, those treated on the third day 36 per cent., on the fourth day 66 per cent., and lastly, on the fifth day, 100 per cent. of deaths.

If, therefore, early intervention in the treatment of plague has a favourable influence on the prognosis of the disease, the quantity and the method of the administration of the serum are also no less important. The doses of serum in plague must necessarily be much higher than those used in general practice, as, for instance, in diphtheria, where there is a well-defined lesion only to deal with; in plague, on the contrary, the glandular affection may be general from the beginning, and the plague germs may be present in the circulation of the blood.

In order to successfully counteract such a severe onset, it is necessary to inject large and repeated doses of the serum. Duprat, at Rio-Grande do Sul, administered *subcutaneously* doses of 200 to 300 cc., and even more, as a first injection, and, according to the severity of the disease, injections of 100 to 150 cc. were repeated every twelve hours. This method gave only a mortality of 15 *per cent.* Apart from other objections, this method, however, requires one to have enormous quantities of serum at one's disposal, which is not always feasible during an epidemic.

Now the *intravenous* method allows of the organism becoming saturated immediately with antitoxin and in lesser doses. Calmette and Salimbeni, at the time of the epidemic in Oporto, showed the efficacy of this method by obtaining unhoped for cures in severe cases, and especially in pneumonic plague. The quantity injected at any one time, then, never exceeded 40 to 60 cc. of serum.

Since then Penna, of Buenos Ayres, has systematically used the intravenous method for treating his cases in the isolation hospital. He first injects not less than 100 cc., followed by a similar injection twenty-four hours later, and, if there is then no perceptible improvement, by a third injection. His death-rate does not exceed 14·2 *per cent.*

The serum has also been administered through the peritoneal cavity, with a mortality of 18 per cent.; but this method is not strongly recommended even by its authors.

The following is briefly the procedure for intravenous injection: The veins selected are those on the back of the hand or on the front of the wrist, or in dark-skinned races on the anterior surface of the fore-arm. The serum must be thoroughly limpid and slightly warmed; the needle is plunged into the vein, and the syringe (filled with the serum and with every air-bubble carefully removed) is then adapted to it; the injection is then very slowly forced on; a drop of collodion over the small needle wound is the only dressing required. There is generally great reaction after an intravenous injection, but the symptoms afterwards improve suddenly, almost as if by crisis; the intense glandular pains cease, and in twenty-four hours plague germs have disappeared from the peripheral circulation, and an examination of the glandular juice shows the absorption of the cocco-bacilli by the polynuclear leucocytes. The accidents due to the serum, such as œdema, erythema, or arthralgia, are only such as sometimes happen with ordinary therapeutic sera, and bear no relation to the doses of the injections or to the methods of introducing the same, and are merely due to the toxic properties normally found in horse blood-serum.

Lastly, the use of *large doses* of anti-plague serum and their administration by *intravenous* injection, cannot be too strongly insisted upon, as serotherapeusis has hitherto proved the only really efficacious treatment of plague, which still claims too many victims.—(J. E. N.)

Notices to Correspondents.

1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the JOURNAL OF TROPICAL MEDICINE should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communications.

STUDIES IN PLAGUE.

By Professor Dr. CAMILLO TERNI.

Biological Laboratory, Museum of Natural History, Milan (Italy).

THOUGH the researches of Kitasato [1], Yersin [2], and of the different scientific commissions in India have solved the problem of the etiology and pathology of plague, we have advanced very little in our knowledge of the treatment of the disease. We have regarded plague exclusively as a septicæmic infection of so rapid a course as to confound the local with the general manifestations. All the specific treatment has therefore been exclusively based on serum therapy, regarding it of value even though all evidence points to the absence of success by this mode of treatment.

The laudable desire to obtain for plague the success which till now serum therapy has given only for diphtheria must not delude us into the belief that there are no other means of treatment.

Therefore, after these years of trial during which anti-plague serum has had a large and well-nigh exclusive application in the treatment of plague, it seems to me useful to state some observations made by myself in numerous clinical cases treated by different methods.

PART I.

THE EFFICACY OF PLAGUE SERA.

In a preceding study [3] I had occasion to point out that the plague bacillus in man does not wholly behave as a septicæmic bacterium comparable to anthrax, and that the penetration of, and the diffusion in, the organism does not happen directly by way of the blood. All the clinical and experimental facts show that plague in the beginning is limited to the lymph system, and especially to the glands, where the plague bacillus finds the most favourable conditions of life and development, producing in the so-called bubo a process of inflammation and necrosis, and the formation of extremely toxic substances which, absorbed, give rise to the gravest and most characteristic symptoms of this infection. The presence of the bacilli in the blood always happens at a very late period, and is a secondary factor in the course of the disease; whilst death usually occurs even before the bacilli from the lymphatics appear in the blood in consequence of the grave intoxication of the products elaborated in the bubo acting with a paralysing effect on the capillary circulation. In many cases also after the blood is infected, we may still obtain spontaneous recovery when the general intoxication is less grave [4]. In plague, therefore, the greatest danger to the patient's life depends on the quantity of toxins elaborated by the bacilli in the predilected focus of the lymphatic system, or in tissues of selection, as, for instance, happens in cases of primary plague pneumonia, in which sudden death by capillary vaso-motor and cardiac paralysis is the ordinary issue, whilst the local lesions are of little consequence in determining a fatal issue (Lutz [5], W. C. Hossack [6], L. F. Childe [7]).

In these conditions it is natural that to obtain a specific treatment of plague, the first requisite of the serum must be a remarkable anti-toxic power, especially in the grave cases, when the inflammation at the point where the bacilli are concentrated has reached the necrotic phase, so that phagocytic action is almost in abeyance owing to the impenetrability of the dead tissues, and toxins are thus allowed to run riot, with grave danger to the patient's life.

The essential conditions of the pathologic process of plague, which I was the first to state, have been amply confirmed by the English Commission in India [8], who opportunely observe that in plague there takes place a combined process of invasion and intoxication, and that therefore it is evident that two different qualities of the therapeutic substances must possibly be applied in the treatment of plague. In the first place, anti-bacterial substances capable of killing or checking the growth of the bacteria; in the second place, anti-toxic substances must be applied in order to eliminate or alleviate the symptoms produced by the bacterial poisons, by which is especially compromised the natural resistance of the organism against infection.

Do the curative anti-plague sera actually in use correspond to the fundamental therapeutic conditions above stated? Certainly not. Yersin's first experiments were too hasty, as proved by their want of success during an extended trial, and they wanted the precision attending the process of animal immunisation according to Calmette's and Borrel's and later Roux's [9] proposals (entire and virulent cultures inoculated into horses in gradually progressive quantities).

Yersin's preparation. The principal fact which characterises the plague infection is that the complexity of the symptoms of intoxication appears as soon as the bacillus instals itself in the lymphatic glands and sets up a bubo. Every observer who has studied the serum therapeutics of plague must now be persuaded that no animal, ordinarily at disposal for such preparation, produces an anti-toxic serum in the highest degree suitable for the treatment of plague; and that it is not even possible to obtain a high anti-bacterial power, to give sure and constant results in the initial period of the infection, when the symptoms of intoxication are not yet manifest.

With the method proposed by Lustig [10] it seemed theoretically easier to obtain the vaccine with a greater degree of solubility, and presumably more assimilable, from the chemical treatment it underwent in the preparation; but we are again confronted with another error, because it is demonstrated that the horses destroy only to a small extent the plague nucleoproteid, and that they do not produce in their serum efficient curative substances. From this point of view it is therefore still better to follow the method of inoculating entire and virulent cultures, by which we obtain a greater stimulating action on the phagocytes and the production of anti-bacterial substances which, though feeble, are yet active enough in the fresh serum, especially if we use for the preparation mules, asses and oxen instead of horses. By using horses we are apt to find that the serum has a toxic action instead of a curative one, on account of the undestroyed bacterial poisons which continue to be still active in the serum.

This perhaps explains the fact that in India the mortality was greatest among those treated with serum, although the "cure" began on the first day of the illness, when the conditions are most favourable for obtaining good results.

The English Commission after years of observations and experiments came to the following conclusions on the question of the anti-plague sera :—

(1) "Though the method of serum therapy as applied to the plague has not yet been crowned with a therapeutic success in any way comparable to that obtained in the treatment of diphtheria, none the less the method of serum therapy is in plague, as in other infectious diseases, the only method which holds forth a prospect of ultimate success.

(2) "The serum treatment has not as yet been sufficiently successful to make it desirable to extend the treatment, under present conditions, as a general measure over all the districts affected with plague. Rather, it appears to us that the imperfections of the present methods of preparation and application should be fully recognised, and that it should be realised that the line of progress lies, not in the direction of applying the sera at present available to the largest number of patients, but in the direction of studying in the case of the animals who furnish the serum the blood changes which are associated with the incorporation of the plague toxins, and with the elaboration of antidotal and bactericidal substance. In like manner, we think that the condition of the blood in the human plague patient and the changes brought about by the administration of the serum should be carefully studied."

These principles we kept constantly before us when working in the laboratory of Messina at the serum therapeutics of plague.

How to prepare by various methods an anti-plague serum of high anti-toxic power was our constant endeavour, and I have already published the researches and the results, which are without doubt superior to those obtained from the sera prepared by Yersin and by Lustig Galeotti, both in the treatment of man and in the experiments on animals. The difference of method in the preparation of serum produced by Yersin and by Lustig Galeotti is not calculated to determine much difference in the quality of the products and in the curative effects; because the former inoculated into the horses either filtrates of cultures or entire cultures; the latter utilised the protein extracted chemically from the dead bodies of plague bacteria. Neither with the one nor with the other method is it possible to obtain a serum with marked anti-toxic action, especially if horses are used for the preparation, and the result of the treatment is merely a stimulus of the phagocytic action, which is not always decidedly manifest even when intravenous inoculation is employed. A slight advantage may be noted in favour of Lustig's serum, as we may infer from the statistics of the Arthur Road Hospital in Bombay, which, however, are not free from faults of method and calculation.

Similar results in treatment of plague we may obtain with the artificial sera of Hayem and of Fodor, and still better by the inoculation of corrosive sublimate proposed by Bacelli on account of the great stimulating power exercised by the sublimate on the leucocytes.

After testing by numerous experiments the toxic action of the pathogenic plague products in man and in animals in contrast with those of the artificial cultures, I proceeded to immunise the animals with the products derived from the infected organism (peritoneal exudate of plague-infected guinea-pigs, juice of buboes, &c.) instead of artificial cultures. As the horses exhibited but little resistance against the action of similar products, we substituted mules and oxen for horses, with very promising results; the anti-bacterial and anti-toxic value of the serum obtained by this method, compared with that of the serum from horses immunised with cultures or with Lustig's nucleo-proteid, stands in the proportion of 50 to 1.

The serum prepared according to this method has been amply applied in Brazil side by side with the sera of Lustig and Yersin. The results, however, though favourable to the new method, showing a total mortality of patients treated with this serum of 25 per cent. only, always leave some doubts on account of the relatively limited experience, and from the fact that epidemics often vary in intensity and virulence. Moreover, my serum was recently prepared, whilst the other two sera used were much older. The great instability of the anti-bacterial and anti-toxic substances of anti-plague serum, no matter how prepared, makes it very difficult to have accurate comparable statistics, when either the sera employed are not the same age, or when the epidemics vary in virulence.

Judging from experiments upon animals, plague often takes on a rapidly septicæmic character, showing that the anti-bacterial substances of the anti-plague serum are rapidly eliminated, so that the results vary sometimes with the same sample of serum if it is first used fresh and then after only four or five days. The same has been stated by the English Commission regarding Lustig's and Yersin's sera [11].

To this circumstance must I ascribe the unsuccessful results obtained in Bombay with my serum, which has been tried in a series of 300 patients under the direct control of Mr. Haffkine, to whom I am deeply indebted for so generously allowing so extensive a trial of my preparation. The serum could be applied only after a delay of nearly six months, and it was impossible to substitute it in time with a fresh one.

The instability of the therapeutic substances of anti-plague serum just related is, however, confirmation of the slight (if any) specific action which it possesses.

By none of the known methods have the serum therapeutics of plague been settled, and in the gravest cases the deficiency of the curative power of the serum on account of the feeble and inconstant anti-toxic action is manifest. With the animals ordinarily at disposal in the laboratories for the preparation of sera on a large scale, it is so far impossible to obtain an anti-plague serum which has a curative anti-toxic efficacy in any way comparable to that of the anti-diphtheritic serum, and to this deficiency we must ascribe the failure of serum therapeutics in plague. Only from man convalescent from grave forms of plague, or from monkeys (*Macacus rhesus*) and from rats (*Mus decumanus*) is it possible to obtain a very active anti-toxic and anti-bacterial serum (reducing to 20 to 30 ccm. of

serum the normal dose of U.I.) sufficient for the treatment of cases with the gravest broncho-pulmonary complications, which till now remain intractable to any kind of anti-plague serum. When great quantities of material are required during an epidemic, it is practically impossible to obtain sera of similar strength, owing to the demand exceeding the supply.

The problem of the specific treatment of plague remains, therefore, still in great part unsolved. The advantages actually obtained with serum therapeutics are very limited, and must be considered as a *good promise for the future*, rather than as a completed or final result.

Part II.

The Surgical Treatment of Bubonic Plague.

Whoever has had occasion to examine a plague bubo in the most critical period of the disease (third to fifth day) will be persuaded that it is impossible to hope that by serum therapeutics the necrotic mass of the lymphatic glands can be destroyed, seeing that phagocytosis cannot develop effectually in dead tissue; the plague bacilli, therefore, develop rapidly and eliminate toxins, which, in conjunction with the other soluble poisons of the bacterial bodies in disintegration, tend to infect the patient's blood and tissues.

By studying the natural evolution of the disease, one arrives at a rational method of treatment.

In the cases of spontaneous recovery the fever falls by crisis after twenty-four to forty-eight hours, and the infection stops before the real bubo is formed, limiting itself to the inflammation of one or two glands. In other cases the spontaneous recovery may occur in a more advanced period of the disease when the bubo is completely developed, that is, when the inflammation affects the majority of all the glands of a given region. In these cases the bubo begins to fluctuate after the critical period (third to fifth day), and the spontaneous issue of the pus towards the tenth to the fifteenth day follows when an incision has not been made. We must therefore consider as of benign prognosis all those cases in which the plague bacillus finds itself in the buboes associated with the pyogenic staphylococcus, *not because these act by attenuating its virulency or the toxicity of the products*, as some observers thought, but because the intervention of these bacteria in the phase of suppuration favours more rapidly the resolution of the illness with the evacuation of the focus of infection. When the pus is not eliminated in time, death will surely follow either by general infection or by slow intoxication. The benefit of the rapid evacuation of the infecting and toxic products accumulated in the bubo in consequence of the suppuration determined by the pyogenic staphylococcus is so evident that since the most remote antiquity the treatment of plague consisted in hastening the suppuration and the opening of the buboes. Recently one of the physicians of Alexandria, Egypt, thought it expedient to inoculate the pyogenic staphylococcus into the plague buboes as a means of cure when they do not manifest the tendency to suppuration [12].

The contrary occurs when the plague bacillus is associated with septicæmic bacteria (diplococcus) or with the streptococcus, because early in the disease a zone of œdematous infiltration round the glands, constituting the bubo, is manifest, involving thereby the surrounding tissues and the skin in the inflammatory process. The diffusion of the plague bacilli becomes thereby easier and more rapid, and a general infection is more certain.

The natural or clinical course, which we see the spontaneous exodus of plague follows, indicates the rational method of the treatment of the disease: namely, *either the possibility of stopping the infective process at the beginning of the infection by serum therapeutics in mild cases, or surgical intervention when the progressive development of the buboes and the gravity of the symptoms of intoxication demonstrate that the specific treatment by serum is not sufficient for recovery.*

It is wholly unscientific to regard plague as quite distinct from other pathological states with which we are familiar. In other forms — lymphangitis and lymphadenitis of a malignant character, no physician would think of applying the serum as an antidote before he intervenes surgically. The only difference is that in plague the local phenomena are less evident at the commencement of the attack and are not pronounced until after general infection has shown itself. In other forms of lymphadenitis the local conditions arrest more readily the attention of the observer, and induce surgical intervention before the symptoms of general intoxication and infection are manifest.

Experience gained in the treatment of plague, especially at the Seaman's Hospital of Rio de Janeiro, allows me to affirm without hesitation that the great mortality observed in the plague hospitals results from the want of or delay of surgical intervention, because the infection remains, for a period of three to five days or more, concentrated in primary buboes and adjacent to lymphatic paths. This danger can be got rid of by eradicating the infected part, when the treatment by serum is evidently inefficacious.

From the results of numerous microscopic and bacteriologic researches made in conjunction with Drs. Gomes and Guimares, in order to determine the method of diffusion of the bacilli from the point of penetration to the bubo, I was persuaded of the benefit of immediate surgical intervention in the treatment of plague by a radical operation—the extirpation of the bubo.

In eighty-two patients who presented phlyctenules or furuncles or other primitive cutaneous lesions, it was not possible to find bacilli in the lymph extracted along the course of the lymphatic vessels between the primary lesion and the initial bubo; nor were bacilli found in the tissues surrounding the capsule of the glands.

From this fact we must infer that the plague bacillus does not find favourable conditions of development in the lymphatic vessels, and that only in the glands is to be found the true focus of infection. The diffusion of the bacilli proceeds gradually from gland to gland, and successively into all the glands of a region before it passes into another group; and the process of infection always moves in the direction of the lymph stream from the more superficial to the deeper parts, and never by the way of the blood, or by inflammation of the intermediate lymphatics, unless there are associated with the plague bacillus other bacteria (diplococcus, streptococcus), in which case

more or less diffused lymphangitis, phlebitis and œdema may be observed.

If, for instance, the primary bubo is femoral, located at the apex of Scarpa's triangle, as usually occurs, the infection extends to all the superficial inguinal glands before it reaches the deep glands situated near the crural canal; subsequently the glands of the pelvic cavity may be involved, but at the beginning of the infection, by microscopic and bacteriologic examination we may verify the infection of the inguino-crural glands, whilst the pelvic ones are still healthy. If, on the other hand, the bubo is axillary and formed by the swelling of the gland situated at the distal part of the axilla, the infection extends to all the glands of the region before it involves the subclavicular group of glands. In the cervical buboes also, if determined by primary plague amygdalitis, the infecting process limits itself for days to one or two glands of the retro-maxillar or superior cervical region without extending to the central and inferior cervical group.

In the histo-pathologic examination of the tissues, it is also easy to demonstrate that the manner of infection of the plague bacillus in the glands, as in other tissues, proceeds always by degrees in small foci, first located in the lymphatic spaces, and later becoming confluent, causing a destruction of the tissue (Albrecht and Ghon) [13], (Bandi and Stagnitta) [14], (Powel White) [15]. These pathologic localisations, characteristic of the primary bubo, distinguish it from the secondary buboes, and correspond to those of the primary foci in other organs (tonsils, lungs); they represent, therefore, the first adaptation of the virus in the new host, and are the seats where the bacilli find the best conditions to acquire the virulence and to display the successive toxic and infecting activity. Therefore we see that these primary lesions in the lymphatic channels can be more easily reproduced experimentally with cultures of attenuated virulence; whilst when the bacilli after several passages through the same animal species have obtained the greatest activity, they do not manifest themselves, because we have then an almost immediate general diffusion. Still, the evidence of their presence is at the beginning more evident in the lymphatic system, before they pass into the blood but without the evidence of localisation in initial foci.

From these observations the necessity of the immediate extirpation of the primary bubo would seem evident, and the possibility of cure, in a disease of so rapidly infecting and toxic a character as plague, will be the more certain the more we practise early elimination of the part which represents the primary localisation of the bacilli in the organism and the point of departure of the general infection. Albrecht and Ghon [16], of the Austrian Commission for the study of plague in India, came to the same conclusion, expressing the opinion that in the treatment of plague *we ought not to neglect the extirpation of the primary bubo, notwithstanding the use of the serum.*

Jamagiwa [17] has also demonstrated that the prompt extirpation of the infected glands is rational and beneficient. And Bandi [18], in some experiments made according to my advice, has also obtained good results in the same direction in animals.

In none of the more recent clinical works on plague has the empiric practice of the past been taken sufficient note of with regard to the surgical treatment of plague. From ancient times we see the principle affirmed that the recovery from plague depends on the rapid evacuation of the buboes, and in order to avoid hæmorrhage they advised the use of caustics or the actual cautery. In all the old writings on the treatment of plague the provocation of suppuration is indicated, and not to wait *too long* if this is retarded, to proceed promptly with early incision, or the use of caustics if the suppuration is not yet manifest on the second or third day.

Our first information concerning the surgical treatment of plague goes back to Hippocrates [19], to Archigenes, referred to by Galen [20], but especially to the Arabian physicians (Eba, Sina, Beitar, Isaac Iudeus, Rhazes), and was made known to Western Europe at the time of the Crusades. In the Orient to-day plague buboes are treated by native doctors by deep incisions and the application of caustics or the red-hot iron.

In the epidemics which desolated France in 1500, the surgical treatment of plague, especially by Ambrois Paré [21] and his school, was stated as the only positive and efficacious method among all the other extravagant remedies then in vogue. The same results were obtained by Settala [22] and Tadino [23] in the famous epidemics of plague in Milan in 1575 and 1630. In the epidemic of Marseilles in 1720, with the better knowledge of practice and the study of anatomy, we see introduced, besides the incision preceding suppuration and the medication with the antiseptics (detersives) of that time—salt water and vinegar, also the extirpation of the buboes by the method recommended by Manget [24].

The persistent opinion of all the ancient observers of plague that the result of the cure depends essentially on two conditions is well enunciated by Settala: *Extract in any way and as quickly as possible the matter in order that it will not spread its poison over all the body.* The necessity and efficacy of the immediate surgical intervention in plague before suppuration occurs acquires greater force by the fact that this method was advised exclusively for plague, whilst for all the other inflammatory tumours (as furuncles, anthrax and buboes of other nature) recourse was had to emollient cataplasms, that is to say, a method of expectancy or a more tardy suppuration.

As a complement of this short account of observations of the past, it is of interest to note that the French physicians, during the war for the conquest of Palestine (1799) [25], established as the general method of treatment in plague *the incision of all those buboes which did not present signs of suppuration, in order to facilitate the crisis.* Before he gave this order, Napoleon's English physician, O'Meara, had an equal number treated by incisions and by the usual method (cataplasm, emollients, or revulsives). The result was that many more recovered by the former than by the latter method of treatment.

If, therefore, so favourable and constant results were obtained in the past when the conditions were much worse and when all the technical and scientific resources of modern surgery were wanting, it seems really strange that we should still doubt the efficacy of surgical intervention in bubonic plague.

The tradition of the surgical treatment of plague continued after the above-mentioned epidemics, as we may gather from Proust [26] and Cabanes [27].

The merit, however, of drawing attention in recent years to the advantages of the surgical treatment of plague is due to J. Cantlie [28].

The extirpation of the buboes, especially when they are still in the initial period, does not present any difficulty, and is also borne by the patients without narcosis, local anæsthesia being sufficient, especially when the bubo is superficial.

The operation in the majority of cases is limited to: (1) Incision of the skin and of the superficial aponeurosis; (2) isolation of the bubo from the surrounding tissues; (3) removal of bubo; (4) examination of the lymphatic glands in the neighbourhood, especially if they are hæmorrhagic or tumefied and painful. Dress the wound in the ordinary way.

The operations made in the plague hospital of Rio de Janeiro during the epidemics of 1900 and 1901 numbered 642, with a mortality of 10 to 15 per cent., varying according to the number of the buboes present, their locality, and the duration of the illness before surgical intervention.

The extirpation of the buboes even in the fatal cases seemed to temporarily afford beneficial effects, so much so as to induce one to entertain the idea of a favourable prognosis. At the autopsy of cases with inguinal-femoral buboes which had been operated upon, the cause of death was found to be due to infiltration of the lymphatic glands of the pelvic cavity, owing no doubt to delay in operation or because the patient objected to operation. On the other hand, we have been able to verify the death of a patient from septic peritonitis after nearly a month's laboured convalescence, caused by evacuation of the ichorous matter of a pelvic gland opening into the peritoneal cavity. This case was one of the most typical to prove the insufficiency of the anti-plague serum, also as regards its anti-bacterial action, for we injected more than 300 ccm., and the bacilli still remained living and virulent in the necrotic focus of the gland.

All the operations have been practised in the gravest cases (pestis major), in ordinarily severe cases (multiple buboes, axillary and groin buboes, double groin and pelvic buboes, cervical, parotid buboes), and the results obtained leave no doubt as to the efficacy of the method.

After duly comparing the results obtained in the plague hospital of Rio de Janeiro from treatment by the surgical method I feel myself justified in recommending it, and in regarding the objection put forward in condemnation of the surgical plan of treating plague buboes as without foundation in fact.

And I am also persuaded that the exclusion of this method of treatment depends upon the want of clinical knowledge of the disease, and upon a strange objection of medical men to surgical intervention in ailments of the lymphatic system generally and not for scientific reasons.[1]

[1] The surgical treatment proposed by myself has also been applied with success in plague cases in Naples in 1902 and 1903, after the serum (Yersin-Roux) treatment had proved useless.

In none of the individuals operated upon was any inconvenience subsequently caused by extensive extirpation of the glands. The patients left the hospital in about fifteen days after operation and ready to recommence their occupations at an early date.

By examining the temperature charts of typical plague cases treated by different curative methods, one observes that in bubonic cases operated upon, the fever falls at once *by crisis*, and at the same time all the grave symptoms of intoxication (delirium, tachycardia, dyspnœa) cease, whilst they continue for a long time when the treatment is limited to serum only.

In order to demonstrate yet further the efficacy of surgical intervention as the rational treatment of plague, in several cases of double buboes we extirpated the glands from only one side, applying at the same time the serum treatment. The improvement in the patients was at once evident after the extirpation of only one bubo, but on the following days the temperature rose again over 39° C., and followed the sub-typhoid type, with tachycardia and delirium. When the treatment was completed by the extirpation of the second group of buboes, the symptoms of intoxication ceased in a few hours, and the patient became convalescent.

Conclusions.

(1) In the plague hospital of Rio de Janeiro, the mortality of the patients treated with anti-plague serum only remained between 25 to 50 per cent., according to the cases and the quality of the sera inoculated. But we must remember that in the statistics in favour of serum therapy are included the mildest cases which ordinarily recover without cure. The estimation of the curative effect of the specific anti-plague sera is very uncertain also on account of extreme variableness of the dose in identical cases. Serum is absolutely of no efficacy in the septicæmic type of plague (infection by the gastro-intestinal way), and in pestis pneumonica, where without doubt it is more necessary to administer a substance capable of rendering innocuous the specific virus in the body of the patient.

(2) The inefficacy of the anti-plague sera which are actually used as a means of cure depends on the deficiency of their anti-bacterial power, and on the almost absolute want of anti toxic substances, because the animals used for the preparation do not readily assimilate and destroy the poisons of the plague bacillus, and do not accumulate in their blood sufficient quantities of anti-bacterial and anti-toxic substances for the cure of man.

On this account we obtain the best results for the serum therapeutics in plague from immunising mules, asses, or oxen, and inoculating them with the juices of the pathogenic products of the animals infected with plague, instead of artificial cultures.

(3) With the artificial sera of Hayem and Fodor we obtained also favourable results, but the inconvenience of inoculating large quantities of liquid directly into a vein induced us to limit the application of such a curative method to a few cases.

(4) With the intravenous inoculations of corrosive sublimate, proposed by Bacelli [29], the mortality oscillated within almost the same limits as those afforded by the specific sera—that is, between 30 to 40

per cent.—and, as I have already indicated, this curative method must be recommended before any other when we have not at our disposal freshly prepared sera, and when it is not possible to practise surgical treatment at a sufficiently early period in the illness. The corrosive sublimate acts as an efficient stimulus of the phagocytosis (Gaglio) [30], and offers the advantage that it is within every physician's reach even in regions where we cannot always hope to have at our disposal other medicaments difficult to prepare, such as sera. It is known also that mercury fixes itself by preference in the lymphocyte of the lymphatic glands and in the plasma, and in this manner sets up an unfavourable condition for the development of the plague bacilli in the tissues which this infecting germ prefers. For this reason I think the use of mercuric chloride preferable to carbolic acid, recommended by Mr. Seymour [31], especially in cases in which we can already demonstrate the presence of the bacilli in the blood.

(5) In grave cases (pestis major) in which it is not possible to expect a success from the serum therapeutics or from other local cures, there remains as the only rational resource the extirpation of the buboes.

I consider the extirpation of the bubo preferable to all the other local cures.

The simple incision of the bubo, with the evacuation of the pus has good results, but has not so rapid and durable an effect in arresting the course of the infection as when the bubo is completely extirpated.

Compresses of tepid disinfecting solutions (mercuric chloride, carbolic acid) are indicated locally, in order to limit the diffusion of the process when the bubo is removed and the injection of those solutions (mercuric chloride, 1 in 1,000, carbolic acid, 1 to 2 per cent.) around the area occupied by the bubo, especially when from the surrounding œdema and from the adhesive periadenitis we may infer that there is a combined action of the plague bacillus, together with other bacteria (*streptococcus, diplococcus*). It is also useful to have recourse to these means when the radical operation is not possible or too long delayed.

All the other local treatments must be considered more pernicious than useful, because they cannot exercise any action on the bacilli located in the tissue of the lymphatic gland, as we thereby lose precious time.

It is an unpardonable mistake to wait for the suppuration of the bubo before we decide upon surgical intervention, because the patient succumbs either on account of the rapid progress of the infection, or from the effect of the toxic products *which cannot be neutralised by the curative action of the serum.* We must not take into serious consideration either the constitution of the individual, nor pay too much regard to the resistance of the patient; whilst the bubo remains the probability of cure becomes always more remote, the operation has to be performed under much graver conditions, because the extension of the infiltration destroys the anatomic relations of the region, and complications, such as phlebitis, lymphangitis, ichorous infiltrations along the muscular sheath, with the danger of an effusion into the cavities, are more likely to ensue.

If it is not possible in the patient's house to provide for the surgical treatment, we can at least give intravenous inoculations of specific serum (20 to 40 ccm.) or of mercuric chloride (1 to 2 centigram of the Bacelli solution), and subsequently bring the patient under better conditions to the hospital.

I may affirm with all confidence that if plague is treated by the above indicated method, the mortality is reduced to the conditions and to the limits of the other infectious and contagious diseases generally considered much less grave in their effects.

The opinion of Scheube [32], who does not think the application of the surgical treatment during an epidemic to be feasible owing to the great number of patients, is scarcely sound, especially when we consider that in time of war surgical operations of much greater severity are rapidly and extensively practised.

Surgeons should be substituted for physicians in our plague hospitals during times of epidemics.

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THE ANATOMY OF THE BITING FLIES OF THE GENERA *STOMOXYS* AND *GLOSSINA*.

By Lieut.-Colonel G. M. Giles, I.M.S. (Rtd.).

(*Continued from p.* 219.)

The parovaria (fig. 9) are two long, somewhat convoluted tubes, the larger distal ends of which are attached to the branches of the oviduct near to the point, where they loose themselves in the stroma of the ovaries. They then pass backwards into the ovipositor, and then turn forwards again to their termination in the common oviduct. They have the same trabecular structure as the paragonia, but the trabeculæ and the nuclei of their internodes are much larger, and a comparison of fig. 9, Plate I., with fig. *b*, Plate II., shows that they also present resemblances in structure to that of the younger ovarioles. They appear to secrete a coagulable fluid similar to that of the paragonia. The remaining accessory structures are the spermothecæ or receptaculæ seminis, of which there are three, each of which (Plate II., fig. *b*.) consists of a dense chitinous sac supported in a cellular mass like an acorn in its cup.

The chitinous membrane is fenestrated, as will be seen in fig. 2, and the ducts are supported by a spiral fibre somewhat like that of a trachea, but much coarser.

Only one coitus takes place between the sexes, and in these sacs sufficient semen is stored on that occasion to last the life of the female.

The ovipositor is quite of the usual type. Lieut. Tulloch describes it as follows:—

"The ovipositor consists of three cylindrical segments of thin chitin, which usually lie telescoped inside the abdomen. There is also a single external flap of dark chitin, which lies folded upon the ventral surface of the fly. When the ovipositor is extruded, by squeezing the abdomen, the receptacula and uterus are pulled down with it and can be seen through the transparent walls. The upper segment has three longitudinal rods of chitin, two dorsal and one ventral. The next is similar, but the last has the two dorsal plates only. The external flap, which is probably the ventral rib of the last segment, is roughly quadrilateral, and has no divergent prong-like processes arising from its free hinder border."

Within the ovipositor is a complicated system of circular and longitudinal striated muscles, which perform the actions of protrusion and retraction.

The male organs of *Glossina*, as far as their histology is concerned, present no notable differences from those of *Stomoxys*, but according to Prof. Minchin, the paragonia are more of the usual type, being distinct from each other throughout. Those of the female, on the other hand, depart entirely from the usual fly-type, being modified to meet the peculiar plan of reproduction of these insects which give birth not to a multitude of eggs but to a very limited number of larvæ. Owing to this, the common oviduct or uterus is of great size, and to expel the large full-grown larvæ the ovipositor is provided with muscles, which, although on the same plan as those of *Stomoxys*, are so enormously developed that a section of this part of the body on a casual glance looks much like one of the thorax of an ordinary fly. Prof. Minchin's description runs as follows:—

"The female genital organs differ considerably in appearance, according as they are in the gravid or non-gravid condition. In the course of my dissections I have only found one female in the latter state. In the later periods of gestation the condition of the female is obvious externally, but females which do not appear to be gravid are found on dissection to have a small larva in the uterus.

"The female organs (fig. 35) consist, like those of the male, of paired and unpaired portions. The former comprise the ovaries, the receptacula seminis and their ducts, and the

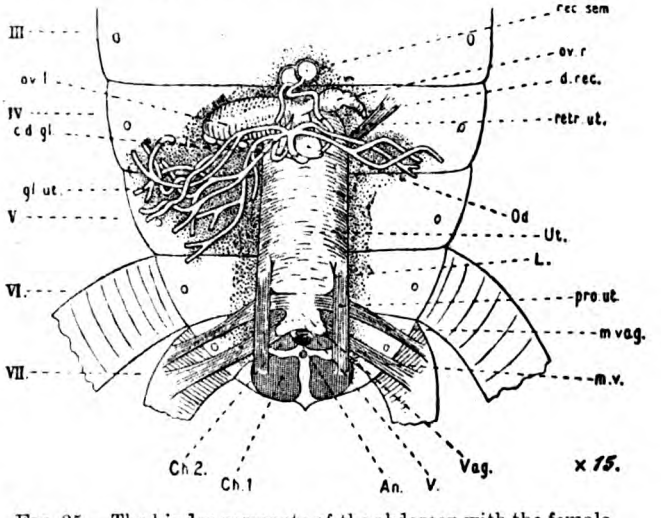

Fig. 35.—The hinder segments of the abdomen with the female genital organs of Glossina *in situ*, dorsal view. *rec. sem.*, receptacula seminis; *ov. r.*, *ov. l.*, right and left ovarioles; *d. rec.*, duct of the right receptaculum seminis; *gl. ut.*, uterine glands (the greater number of these have been removed); *c. d. gl.*, their common duct; *retr. ut.*, retractor muscle of the uterus; *Od.*, oviduct; *Ut.*, uterus; *L.*, hinder extremity of the larva, causing a bulge in the uterus; *pro. ut.*, protractor uteri, attached to the chitinous plate (*Ch.* 1); *m. vag.*, muscle (dilator vaginæ?) passing from the vagina to the tergum of the seventh abdominal segment; *m. v.*, muscle passing from the paired chitinous plate (*Ch.* 2) on each side of the vulva to the seventh tergum; *Vag.*, vagina; *V.*, vulva, the anterior margin of which is shown by a dotted line; *An.*, anus; *Ch.* 1, *Ch.* 2, paired chitinous plates. (After Tulloch.)

uterine glands; the latter are the oviduct, uterus, and vagina. The female system of organs is considerably modified from the condition usually found in insects, in relation to the fly's peculiar method of reproduction.

"The ovaries are reduced to a single pair of ovarian tubes or ovarioles, one on each side of the body (figs. 35 and 36, *ov. r.*, *ov. l.*). Each ovariole shows only a small number of egg-chambers, not more than four or five. The lowest chamber is very much larger than any of the others, and contains a large ovum. When this ovum is comparatively small, the other egg-chambers are in a line with it (fig. 6,

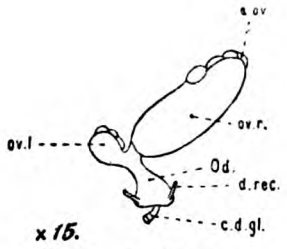

FIG. 36.—The ovarioles and oviduct of a non-gravid female Glossina. *a. ov.*, apex of right ovariole; other letters as in the preceding figure. The very large ovum in the right ovariole has pushed the oviduct over towards the left side of the body.

ov. r.), but as the ovum grows larger it grows past the other egg-chambers, so that they appear attached to the side of the ovum (fig. 35, *ov. l.*, fig. 36, *ov. l.*, *ov. r.*).

"The two ovarioles are always asymmetrical, owing to the fact that the ova in the lowest egg-chambers reach full growth on each side alternately, so that if there is a large ovum on the left, there will be a smaller one on the right, and *vice versâ*. The largest ovum I have seen was from a non-gravid female (fig. 36, *ov. r.*), and was probably nearly, if not quite, full-sized.

"The two ovarioles open into the short, broad oviduct (figs. 35 and 36, *od.*), which widens out at its lower end to open into the uterus slightly behind the proximal end of the latter.

"At its distal-expanded end the oviduct receives right and left the two ducts (*d. rec.*) of the receptacula seminis. The latter (*rec. sem.*) are small spherical bodies of a bright orange-yellow colour, surrounded by a whitish, transparent envelope. Examination of the receptacula stained and mounted in Canada balsam shows that the clear envelope is an epithelium of large cells, surrounding a thick chitinous membrane which gives these organs their peculiar colour, and which is too opaque for the contents to be seen except in sections, by which method the receptacula are seen to be filled with spermatozoa. The two receptacula are firmly attached to one another. From each comes off the slender white duct, slightly convoluted. The ducts are perfectly distinct from one another, and open, as described above, into the lower end of the oviduct.

"Immediately below the opening of the oviduct into the uterus, a small tube debouches into the latter by a median dorsal aperture. This is the common duct of the uterine glands (figs. 35 and 36, *c. d. gl.*). After a short course it branches right and left into tubes, which branch again repeatedly, forming a great number of glandular tubes, which differ markedly in the gravid and non-gravid condition. In the latter state the gland-tubes are relatively few and very slender. In the gravid condition, on the other hand, the tubes are very numerous, forming a tightly packed mass filling up the posterior end of the abdomen, and requiring to be pulled away to show the other parts of the generative system; further, the individual tubes are much thicker, and when stained and mounted, they take up the stain very deeply and appear very opaque. There can be no doubt that these glands serve for the nourishment of the larva in the uterus.

"The uterus (*Ut.*) is a large thimble-shaped organ attached to the body-wall by a number of muscles. Two retractors (*retra. ut.*) run forwards from the proximal end. There are two pairs of protractors, one dorsal, the other ventral; the former (*pro. ut.*) start from the sides of the uterus and pass backwards to a pair of chitinous plates (*Ch.* 1) at the posterior end of the body. The wall of the uterus is beset by a very large number of small tracheal tubes (not shown in the figure), and is thick in the non-gravid condition, but becomes thinner when stretched by the growth of the contained larva. In all gravid uteri that I have seen, the two papillæ at the hinder end of the larva cause a bulge in the lower end of the uterus (fig. 35, *L.*). When the larva reaches a certain size, the rings of its segments become plainly visible through the wall of the uterus; they could not be seen in the uterus drawn in fig. 35; but in another, slightly larger, they could be seen distinctly."

The writer is under the impression that there are three and not two receptacula seminis, but the opinion is derived from series of sections and not from dissection.

Only four or five larvæ are produced by each female in a season, so that the insect is much less prolific than even certain mammals, and it can scarcely be doubted that this circumstance offers the best hope of their destruction, as it is obvious that under such conditions the destruction of an adult is a much more serious blow to the chances of multiplication of the race than that of many score of the ordinary oviparous flies. It seems, then, that much might be hoped for from the systematic destruction of the adult flies, and in view of the terrible ravages of sleeping sickness, it cannot be denied that the object is one on which considerable expenditure of money and energy would be more than justifiable.

"Berliner Klinische Wochenschrift," vol. xliii., No. 7.

AFRICAN RELAPSING FEVER.

Koch finds that although quinine is useless in relapsing fever, the trypan-red is of some value. Seeing that immunity is conferred by one attack, Koch is led to hope that some form of serum treatment will be found efficacious. Whilst travelling in an endemic centre of the disease, Koch found that by pitching tents on fresh ground, apart from the old-standing shelters, relapsing fever could be avoided, as the tick only prevails in the dry, long-built shelters on the caravan route.

"Annales de l'Institut Pasteur," Paris, vol. xx., No. 3.

THE FRENCH REPORT ON YELLOW FEVER.

Marchoux, E., and Simond, P. L., in the final instalment of the Report on Yellow Fever by the French Commission to Brazil, go fully into the part played by infant infection in maintaining the endemicity of yellow fever. An outbreak of yellow fever leaves the community almost entirely immune to the disease. Those who escape at the time of the epidemic may subsequently develop the disease in the form of sporadic cases, but were it not for new-born infants the non-immunes would soon be exhausted. Owing to the mildness of the disease in children the affection may escape notice, and because the adults are not attacked the disease is supposed to have died out, whereas in reality it is being continued amongst the infants. This possibility serves to explain how non-immune aliens contract the disease on arrival in the yellow fever zone. The apparent immunity of the negroes to yellow fever is no doubt explainable on the assumption that they had a mild type of the disease in infancy and thereby became protected against subsequent seizure.

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THE

Journal of Tropical Medicine

AUGUST 1, 1906.

LIVERPOOL SCHOOL OF TROPICAL MEDICINE—MEMOIR XVIII.

REPORTS OF THE EXPEDITION TO THE CONGO, 1903-5. By the late J. Everett Dutton, M.B.Vict., and John L. Todd, B.A., M.D., C.M.McGill, with Descriptions of Two New Dermanyssid Acarids by Robert Newstead, A.L.S., F.E.S., &c., and "The Anatomy of the Proboscis of Biting Flies," by J. W. W. Stephens, M.D.Cantab., and Robert Newstead, A.L.S., F.E.S., &c. March, 1906. (London: Published for the Committee of the Liverpool School of Tropical Medicine by Williams and Norgate, 14, Henrietta Street, Covent Garden.) Price 7s. 6d. net.

I.—GLAND PALPATION IN HUMAN TRYPANOSOMIASIS.

Dr. Todd and the late Dr. J. E. Dutton, in their 1904 report of their expedition to the Congo, drew attention to the usefulness of examining the fluid extracted by gland puncture as a routine method of diagnosing the presence of trypanosomes in the human body. The prevalence of enlargement of glands in trypanosomiasis is not only a marked feature, but its universality and constancy are diagnostic signs, and in the report now before us an enquiry into the practicability and reliability of this method of demonstrating the presence of trypanosomes in the human body has been gone into fully.

Gland Puncture.

The technique of gland puncture is simplicity itself, although requiring care and some experience before satisfactory results are obtained with certainty. An ordinary hypodermic syringe, after the instrument and skin have been rendered aseptic, is plunged into the substance of an enlarged subcutaneous gland held steadily in place between thumb and forefinger.

To prevent scattering the tiny quantity of fluid in the barrel of the syringe by the sudden influx of air when the needle is withdrawn, release the plunger, which had been drawn out to full extent, before the needle is withdrawn from the skin. The drop of fluid in the syringe is expelled from the syringe on to a slide, a cover-glass superimposed, and the preparation, ringed with vaseline, is examined at once. Examination of a first preparation of gland fluid is frequently negative. When glands are particularly soft the fluid obtained is apt to be glairy and pus-like, and therefore rarely contains trypanosomes. The glands usually selected for the examination are those of the post-cervical region.

Comparisons of Clinical Methods of Demonstrating Trypanosomes.

Successful examination may be estimated from several standpoints. When, however, the first test was unsuccessful, further examination succeeded in demonstrating the presence of parasites; the result was as follows:—

	Blood			Gland Juice	Cerebro-spinal Fluid
	Fresh Coverslip Preparations	Centrifugalised	Total		
Percentage of successful examinations	13·3 %	41·2 %	49·2 %	90·4 %	59·6 %
Number of repeated successful examinations	2	1	—	17	No second examination was successful

It will be seen that according to the table the examination of the cerebro-spinal fluid gave moderately constant results only; but when a closer analysis is made it is found that it is in advanced cases of the illness that the examination of the cerebro-spinal fluid gives a high percentage of positive results. By "advanced" cases are meant persons obviously ill; in "early" cases no general symptoms are presented, and the disease is unsuspected by friends.

	Blood			Gland Juice	Cerebro-spinal Fluid
	Fresh Coverslip Preparations	Centrifugalised	Total		
Advanced Cases					
Percentage of successful examinations	20·6 %	53·8 %	57·3 %	95·6 %	96·6 %
Early Cases					
Percentage of successful examinations	8·6 %	25 %	31·4 %	98·5 %	13 %

As trypanosomiasis advances, the glands of all the superficial groups diminish in size, so much so that it is occasionally difficult to find a gland large enough to puncture. As, however, it is during the early stages of the disease that diagnosis by other than clinical features are called for, there can be no doubt that gland puncture is by far the most efficient method of demonstrating the presence of trypanosomes in cases of trypanosomiasis.

Glandular Enlargements an Index of Trypanosoma Infection.

As the result of extensive examinations of many people in many villages, Drs. Todd and Dutton came to the conclusion that in the great majority of cases enlarged cervical glands in apparently healthy negroes means trypanosomiasis in an area where "sleeping sickness" is prevalent.

The region of the body examined for gland enlargement was the posterior cervical group, just in front of the anterior border of the trapezius. In this situation usually three or four middle-sized glands (diameter 1 cm.) lie at the base, or one or two glands of smaller dimensions are met with at the apex of the triangle, where trapezius and sternomastoid muscles meet at their occipital insertions. Occasionally, however, the whole of the posterior triangle of the neck is literally filled with enlarged glands.

Another clinical point of significance is that "unless the glands of apparently healthy persons were enlarged, juices from them did not contain trypanosomes."

The conclusions arrived at by Drs. Todd and Dutton are that (1) as a rule enlarged cervical glands, without obvious cause, do not occur in districts from which trypanosomiasis is absent; (2) every negro with enlarged glands must be considered, until the contrary is shown, to be a case of trypanosomiasis; (3) early cases of trypanosomiasis have enlarged glands, and will therefore be detected by gland palpation; (4) good results may be expected from the serious application of quarantine measures dependent for their efficiency upon cervical gland palpation.

Prevalence of Trypanosomiasis.

By a series of maps the distribution and spread of sleeping sickness in the Congo Free State is clearly shown, and several interesting facts are dealt with by the same observers under this head. The distributing factor, *Glossina palpalis*, is found everywhere along the route followed by sleeping sickness disease, and it is significant to note that there are several districts in which Glossinæ are found in which there is no sleeping sickness; in other words, the disease may be expected to spread corresponding with Glossina prevalence. It seems from all available evidence that sleeping sickness has spread, and is spreading, more widely as increased facilities of communication multiply; yet it is a mistake to believe that previous to 1885, when the Congo Free State was founded, sleeping sickness was so limited in its distribution as we are apt to imagine. Before the inroad of Europeans in 1884 the highest point in the Congo known to be infected by sleeping sickness was at the town of Bumba, situated on the northern bank of the Congo at the point where the great bend of the river makes its most northerly point, and about 700 miles in a straight line inland from the mouth of the river. In all the districts between Bumba and the mouth the natives knew and had a name for the disease, whereas in the Upper Congo reaches above Bumba the disease is, or was until recently, quite unknown, and the natives either coin a new word to describe it or use a name borrowed from neighbouring tribes. In 1888 the first step towards suppression of the slave trade began, expeditions were sent in all directions, and soldiers and labourers from the infected districts of the Lower Congo travelled upwards along the Kasai River, and penetrated far to the eastward, carrying with them sleeping sickness. In addition to the traffic from west to the east, that is, from the infected districts near the mouth of the river inland, labourers were brought from the upper reaches of the river to work near the mouth, who, when their term of engagement ended, returned to their native places, thereby no doubt spreading infection to many new centres.

The evidence obtainable is, however, not sufficiently unanimous or positive to assert that sleeping sickness did not exist in the area between the Upper Congo and Lake Tanganyika, but that there has been a wider distribution of the disease in many directions since the traffic between Central Africa and the mouth of the Congo has been increased is certain. One point in the investigation seems fully brought out, namely, that when sleeping sickness has once gained a hold on a district, there is no evidence that the disease ever wholly disappears.

"A New Dermanyssid Acarid Found Living in the Lungs of Monkeys (*Cercopithecus schmitdi*) from the Upper Congo." By R. Newstead, A.L.S, and J. L. Todd, M.D.

In the district between Lusambo, in the upper reaches of the Kasai River, and Kasongo, in the Upper Congo, a parasite named *Pneumonyssus duttoni, n. sp.*, has been found in eleven monkeys of the *C. schmitdi* species. The parasite has not been met with amongst monkeys of other species living in the same district, so that it would seem that the "funny type" (*C. schmitdi*) of monkey is alone affected. Female acarids only have been found in the lungs of these monkeys, and although no eggs have yet been seen,

larvæ and partially matured acarids were found in the trachea and bronchi of the monkey, from the larynx down to the second and fourth, and even fifth branchings of the bronchi. The species of acarid closely resembles *P. simicola* found in the lungs of a Javanese monkey, but differs in the possession of an additional pair of stigmata, and a large dorsal scutum or shield.

Mr. Newstead also describes another new Dermanyssid acarid, which he has named *Pneumonyssus griffithi, n. sp.*, obtained from the lungs of the Rhesus monkey (*Macacus rhesus*). The parasite has been named after its discoverer, Dr. C. A. Stanley Griffiths, The new acarid was first found in a series of six adult Indian Rhesus monkeys, belonging to the Royal Commission on Tuberculosis, which were killed for examination, on account of having been in contact with a monkey suffering from spontaneous tuberculosis.

"The Anatomy of the Proboscis of Biting Flies. By J. W. W. Stephens, M.D., and R. Newstead, A.L.S.

The species of fly examined was the tsetse-fly, *Glossina palpalis*, R. D., and the description refers to the female of that species for the most part. In this erudite description many hitherto unsettled points in the anatomy of the labella, labium, labrum, hypopharynx, and the mechanism of the proboscis are dealt with and apparently settled. Many excellent drawings of the proboscis of the Glossina accompany the descriptive details.

THE MEETING OF THE BRITISH MEDICAL ASSOCIATION AT TORONTO.

THE visit of the British Medical Association to Toronto promises to be a success, judging from the large number of medical men who are journeying from Britain to attend the meeting. The Association has previously met in Montreal, but Toronto is the furthest distant point from "home" at which British medical men have assembled. Situated on the shores of the Lake Ontario, the focus of several railway lines, and adjacent to important agricultural districts, Toronto has increased of late years to a commercial city of great importance. The public buildings and the wide, handsome streets of Toronto are held in high estimation by the citizens, who are justly proud of their flourishing city. To medical men, however, the University buildings and the history and development of the University are sure to prove more interesting than either the natural beauties of the district or the municipal and commercial buildings of the city itself.

The movement which resulted in the establishment of a Provincial University in Ontario (then Upper Canada) dates from the closing years of the eighteenth century. In 1797 the Governor of the Province, at the request of the Legislative Council and House of Assembly of Upper Canada, petitioned His Majesty George III. to appropriate "a certain portion of the waste lands of the Crown as a fund for the establishment and support of a respectable grammar school in each district of the Province, and also of a college or university." The petition was granted, and the Executive Council, in conjunction with the Judges and Law Officers of the Crown in the Province, were instructed to report on the manner and extent of the appropriation. Their report (1798) recommended: (1) The immediate establishment of a grammar school at Kingston, and another at Newark (now Niagara); (2) the establishment of a grammar school at Cornwall, and another at Sandwich as soon as funds should permit; (3) the establishment of a University in York (now Toronto); (4) the appropriation of 500,000 acres of Crown lands for the establishment and maintenance of the four schools and University; and (5) the reservation of at least one-half the whole grant for the purposes of a University. In 1799 the appropriation of lands was made, consisting of 550,274 acres.

From 1799, the project made no progress whatever. In 1819, however, a report was drawn up by the Executive Council, looking towards a realisation of the land endowment, recommending the obtaining of a Royal Charter. In 1820 provision was made by law for the representation of the proposed University by a member in the House of Assembly. In 1825, the exchange of a portion of the original grant of lands for an equal portion of the more valuable "Crown Reserves" was proposed, and was carried into effect in 1828. In 1827 the Charter was granted for the University under the title of the "University of King's College," and the necessary authority was given for the exchange of the original endowment lands above referred to. By this Charter, the teaching, examining and management were entrusted to a corporation, consisting of the Chancellor, President, and Professors.

By the Baldwin Act, the name of the institution was changed from King's College to that of "University of Toronto." Its secular character was made perfectly clear; not only were all religious tests abolished, as regards the Faculty, students and graduates, but it was also provided that neither the Chancellor nor any of the Governor's representatives on the Senate should be "a minister, ecclesiastic or teacher, under, or according to, any form of profession of religious faith or worship." The Faculty of Divinity was abolished, as also the right to confer degrees in Divinity.

In 1887 an Act known as the Federation Act was passed, whereby the various denominational institutions were united with the University of Toronto. Under this Act, Victoria University (Methodist), St. Michael's (Roman Catholic), Knox College (Presbyterian), Trinity and Wycliff Colleges (Anglican), have entered into confederation with the University of Toronto, which latter has also, under the Act, a teaching Faculty of Arts and Medicine. Latin, Greek, Ancient History, English, French, German, Oriental Literature and Ethics are taught both by University College and Victoria University, and the other colleges mentioned, while St. Michael's co-operates in teaching Modern History and Philosophy. By this arrangement, largely one of convenience, all other subjects in Arts and all subjects in medicine are left to the teaching Faculty of the University of Toronto. Both the University of Toronto and University College are supported from a common fund derived from endowments and other sources. Various institutions, such as the School of Practical Science, the Agricultural

College, &c., have entered into affiliation with the University, and enjoy representation in the Senate, which in turn prescribes their curriculum and examines their students.

The architectural beauties of Toronto University are well known. The main building is a handsome structure in the Norman style of architecture, and its classic main entrance is without a rival on the American continents. This building was badly gutted by fire some years ago, but its restoration was thorough and complete, and the building now presents a finer appearance than it did before the conflagration. The University campus is dotted with a series of buildings, each housing a certain branch of the University's work.

Report.

REPORTS ON THE HEALTH AND SANITARY CONDITION OF THE COLONY OF HONG KONG FOR THE YEAR 1905. (Hong Kong: Noronha and Co., 1906.) Pp. 140.

The estimated total population of Hong Kong, including the adjacent territories of Kowloon (old and new) and the military and naval commands, amounts to 377,850. The birth-rate is given as 3·40 per 1,000, and the death-rate as 17·45 per 1,000. The disproportion between the birth- and death-rates which seem unaccountable with a rapidly increasing population is attributable to the fact that the Chinese women in the colony are few in number, and that the wives of the Chinese do not, as a rule, dwell in the colony.

Malaria.—During the past three years the total number of deaths amongst Chinese attributable to malaria has diminished by half, compared with the returns of the previous three years. Amongst Europeans resident in Hong Kong the deaths from malaria during 1905 fell to four, compared with 29, 33, and 32 during the three years 1900-1902.

Dr. J. Bell, the Superintendent of the Civil Hospital, remarks: "There can be no question that the war waged by the authorities against the mosquito has given as good results here as anywhere else." One district in the outskirts of the city of Victoria, which used to supply very bad cases of malaria both in Europeans and their Chinese servants, has not supplied a single admission for 1905. The malignant variety of malaria is much the most common variety and the disease is more prevalent in the latter half of the year.

Dysentery.—The bacillary form of dysentery outnumbered the amœbic variety in a proportion of about two to one. The bacillary form of dysentery would appear to confer an immunity against further attacks, but not against the amœbic type; one patient suffered in January from the bacillary form, but returned to hospital in October of the same year with dysentery of the amœbic type.

The Superintendent of the Civil Hospital states: "I think the amœbic variety is the less prevalent and fortunately so, as it is a much more serious complaint, more difficult and more tedious to treat—in some cases I doubt whether they are ever cured by anything short of removal out of the Tropics." In regard to the spread of dysentery the Superintendent writes: "The mobile form of the amœbæ die rapidly in the stool, but the encysted form are much hardier, and must be the means of spreading the disease. The question for the future to solve is whether they do not undergo some change in a suctorial insect, and so get passed on to man in a manner similar to malaria."

Plague.—During 1905 the plague cases numbered 304 and the deaths from the disease amounted to 287—a death-rate of 94·1 per cent. These are the smallest figures in regard to plague since 1894, except during the years 1895 and 1897, when the cases of plague numbered 44 and 21 respectively. Of the cases, 73·16 were of the bubonic type, 25·0 per cent. were of the septic type, and 1·84 of the pneumonic variety. Dr. W. M. Koch, the officer in charge of the Infectious Diseases Hospital, remarks: "Of the bubonic variety 85 per cent. died; of septic cases, 60 per cent. It will be noticed that the bubonic variety was the more fatal."

Rat Plague.—"The amount of rat plague," Dr. William Hunter, the Government Bacteriologist, remarks, "would appear to be increasing in the colony. About 5 per cent. of the rats examined during 1905 were found to be plague-infected." He adds: "Arguing from the dictum no rat plague, no human plague, our chances of freeing the colony from this exotic are but small for some years to come." Dr. Hunter is more and more impressed with the part played by the rat in the spread of plague, and experience shows that "Danysz's virus as an agent for the wholesale destruction of rats has been a complete failure." Experience with Yersin's serum in plague during 1905 in Hong Kong is not encouraging.

Relapsing Fever.—Three coolies, on their way to North China from South Africa, were found to be suffering from relapsing fever, and the spirillum was found in their blood. In connection with these cases, an important fact was noted. The office boy of the hospital, to which these cases of relapsing fever were admitted, was attacked by the disease. The boy saw the patients frequently, and helped to coax mosquitoes to feed on them, and assisted in procuring films, but had nothing else to do with the patients in the way of nursing, &c., yet he passed through a typical attack, and the spirochætæ were found in his blood. The question of how he contracted the disease is a difficult problem to solve, but the fact that he did so under the circumstance is well worth further investigation. Relapsing fever is prevalent in North China, but is not endemic in Hong Kong.

Malta fever has not been proved to be present in Hong Kong as an endemic infection.

The experiments and observations on beri-beri by Dr. Hunter will be specially dealt with in a future issue.

This report, which will be dealt with in the Colonial Reports, is full of interest, and contains many original investigations and observations.

Reviews.

NUTRITION AND DYSENTERY. By Lieutenant-Colonel U. N. Mukerji, M.D., I.M.S., Retired. (Calcutta: S. K. Lahiri and Co.)

It is pleasant to find that this well-known native member of the Indian Medical Service, although retired

from the service, has no intention of retiring also from active scientific work, and in the present little volume we have the results of a ripe experience in dealing with that most troublesome tropical malady, dysentery.

Dr. Mukerji's view is that dysentery is primarily a trophic malady, the main predisposing causes of which are dietetic errors; in other words, that the dyspepsia of dysentery is the cause and not the consequence of the disease in the stage in which it usually comes first under the notice of the medical practitioner.

Nor is this view in any way incompatible with the results of modern parasitological investigations which have subdivided dysentery into protozoal and bacterial forms, and the latter into a number of varieties in which Shiga's bacillus and a variety of other strains of microbe are found in the motions, for most who have had much to do with the clinical side of dysentery will agree that it is almost impossible from the bedside point of view to predicate what micro organisms will be found by the bacteriologist, and that it is highly probable that it is rather the disease that affords them their opportunity than that they are the *causa causans* of the disease. On this account the reader must not expect to find more than casual mention of the microbiology of dysentery, which has, of course, only an indirect connection with the point of view dealt with by Dr. Mukerji.

There is no better field for the study of dysentery and the effects of diet on nutrition than an Indian jail, as the Indian medical officer acts not only as the physician, but also as governor of these institutions, and is wisely given a very free hand in the management of the dietary of the prisoners.

The service will, we feel sure, be grateful to an old brother officer for many useful hints on the management of prisoners, and the author's intimate knowledge of Indian habits of life, and their bearing on health, will make the book a most interesting one to all who practise in our great dependency. Nearly half the book is occupied with the results of a laborious investigation of the amount of urea excreted in a group of prisoners from March to July—the monthly diet scale being given in a preliminary table, but we fail to find any summing up of the conclusions the author draws from the tabulated results.

Col. Mukerji has a very high opinion of the value of the inunction of oil as a protection against chills, and hence in diminishing the incidence of dysentery, and the reviewer recalls that although in the United Provinces it has been found that a liberal provision of blankets is equally effectual, an issue of oil for this purpose to the "old and infirm" prisoners was attended with most beneficial results.

Here and there peculiarities of diction may be noticed, only natural to an author who writes in other than his mother tongue, but we doubt if any European could be mentioned who would be capable of writing as clearly in Hindustani or Bengali, and the construction will present no difficulties to any one who has lived in India.

Remembering the difficulties that beset the typographer in India, the book has been turned out by the publisher in a creditable fashion, though occasional misprints may be met with.

SCIENTIFIC MEMOIRS. By Officers of the Medical and Sanitary Departments of the Government of India. "On a Parasite found in the White Corpuscles of the Blood of Palm Squirrels." By Captain W. S. Patton, M.B., I.M.S. (Calcutta: Office of the Superintendent of Government Printing, India, 1906.)

Captain Patton's conclusions are as follows: It will be seen that the description of this parasite agrees in every detail with that of a hæmogregarine. The parasite is highly specialised in that it selects the large mononuclear leucocyte for its host. Though closely related to *Leucocytozoon canis* (James), it differs in not having a cytocyst and in possessing a tail. I therefore propose provisionally naming it *Leucocytozoon funambuli.*

As in the case of *Hæmogregarina gerbilli* (Christophers), no developmental forms were found in the organs and the infection remains unaltered for long periods. The squirrels, though harbouring two parasitic worms, were to all appearances as active as the Madras species. It is particularly interesting to note that trypanosomes were never found in the blood of the Kathiawar squirrel, which seems to point to a localised distribution of the blood parasites in very closely related mammals.

Correspondence.

To the Editors of the JOURNAL OF TROPICAL MEDICINE.

SIR,—Mrs. Scharlieb, reported in your issue of April 16th, 1906, writing about the Tropics, says: "Milk is not attainable in some places, in others it is very poor in proteids and fats."

I should be glad of some proof of the latter part of this statement, some published analyses of milks known to be unadulterated, secreted by cows in the Tropics would be useful.

Yours faithfully,

J. TERTIUS CLARKE, L.R.C.P.Lond., M.R.C.S.Eng., D.P.H.Camb.

S. D. S.,
Batu Gajah, Perak,
June 26th, 1906.

Drugs and Remedies.

PRICKLY HEAT.—The "Cyclopædia of Medicine and Surgery" recommends as a prophylactic treatment for prickly heat (miliaria) that thin, light woollen garments should be worn next the skin, the body exposed to heat as little as possible, constipation avoided, and the following lotion applied locally:—

℞.	Acidi carbolici	...	...	ʒss.
	Acidi boracis	...	...	ʒj.
	Zinci oxidi ...	...	...	ʒiss.
	Glycerini ...	...	...	ʒii.
	Alcoholis ...	...	...	ʒii.
	Aquæ q. s. ad.	...	...	ʒvi.

A dusting powder consisting of:—

℞.	Magnesii carb., acidi borici, pulv. amyli, &c. ...	...	...	aa ʒii.

When the entire body is involved the patient should

have bran, starch, or alkaline baths. Hyde recommends:—

℞.	Acidi carbolici	...	...	ʒiss.
	Glycerini	...	...	ʒii.
	Mentholis	...	...	ʒj.
	Sp. vin. rectif.	...	...	ʒi.
	Aquæ q. s., ad.	...	...	ʒviii.

to be applied locally.

Acting upon the suggestion of Professor Metchnikoff in his address on "Syphilis and its Prevention," Mr. W. Martindale, 10, New Cavendish Street, Cavendish Square, London, W., has prepared a "prophylatic ointment," suitable for instant use, and in a conveniently portable form.

Books and Papers Received.

THE first number dated July, 1906, of the *Calcutta Medical Journal*, described as the journal of the Calcutta Medical Club, is to hand. The new journal, of which Dr. K. Das is the editor, is to be published monthly at the cost of 8 annas per copy. The journal is intended for the publication of the transactions of the scientific and clinical meetings of the club and other matters of professional interest.

The following articles are among the contents:—

(1) "Ranchi, a Health Resort." By Nareshchandra Mitra, M.A., M.B. The town of Ranchi, sometimes termed "Darjeeling of the Plains," is situated on a tableland more than 2,000 feet above sea-level, and lies 240 miles south-west of Calcutta. The "season" commences in October, and extends throughout the winter. During the winter the climate is pleasant and bracing, and the isolated position of the town serves to prevent the occurrence of epidemic diseases.

(2) "Trypanosomidæ." By Gopalchandra Chatterjee, M.B. The article embodies a summary of trypanosoma met with in men and animals, nineteen in all, and three species of trypanoplasma in animals.

(3) "Oxalate of Lime in Pregnancy." By I. Mallick, M.A., L.M.S. According to this observer oxalate of lime diminishes during pregnancy.

(4) "A Large Intra-cervical Fibroid." By K. Das, M.D.

(5) "A Case of Cerebral Tumour, with no Symptoms." By C. Chackrabarty, M.B.

(6) "Angioma of the Liver." By M. Mitra, M.D., F.R.C.S.Edin.

In the journal are to be found the Transactions of the Calcutta Medical Club for February and March, 1906; and in addition reviews of current literature. We wish the journal success.

Notes and News.

THE SOUTH-WEST MONSOON.—*The Times of Ceylon* of May 25th, says: The south-west monsoon has done something more than come in like a lamb. It has crept in like a thief in the night, furtively and unannounced. It was here all the while. The monsoon arrived on May 7th, Mr. Barnard, Superintendent of the Trigonometrical Surveys, informed a representative this morning. The burst, Mr. Barnard explained, was a traditional and popular term, but was not recognised scientifically, so he was unable to say whether the monsoon had burst. "I have known the monsoon arrive where there is a perfectly clear sky," he remarked. "It came exceptionally early this year. Since the 7th of this month we have really been in the true monsoon. This is indicated by the direction of the wind, which settled down to blow in the south-west on that date."

Mr. Barnard, in speaking, had charts before him showing the direction of the wind each day. He added: "Other conditions, such as wind velocity, the temperature of the atmosphere, rainfall, &c., place it beyond doubt that we have been experiencing the south-west monsoon at least since the 7th inst. The wind was variable before that. The big rains started on the 13th inst., but the velocity of the wind was not affected at that date. The monsoons vary as to rainfall. It is too soon to say, yet, whether this is a monsoon of exceptionally light rain. In the next few days, or next week, we may have more than will make up for the deficiency."

Despite this statement, the Ceylon people do not believe that the monsoon has yet appeared. Yesterday evening certainly was monsoonish, but the usual signs of heavy rain and strong south-west wind are still absent, according to popular notions.

REPORTS from India, dated June 22nd, state that the south-west monsoon has set in throughout the whole of India, including the Punjab and Himalayas.

INDIAN MEDICAL SERVICE.—The Secretary of State has sanctioned the appointment of officers of the Indian Medical Service to be Director of the Pasteur Institute at Kasauli and Assistant Directors at the Kasauli and Coonoor Institutes, on the scale of salary sanctioned for officers of the Bacteriological Department. An addition of three officers will be made to the Indian Medical Service in order to provide for these requirements.

PESTIS SIMULANS.—E. S. Goodhue, writing from the Hawaiian Islands, on "Hawaii as a Field for Scientific Work in Tropical Medicine," states that Dr. Sinclair of Honolulu, suggests the term pestis simulans, instead of pestis minor, for a climatic bubo as defined by Cantlie. Pestis simulans is commendable "as being non-committal for cases that run a mild course of true plague in districts where plague is more or less epidemic, and where it is impossible to demonstrate the presence of plague bacilli."

INDIA has a staff of mounted army nurses. The Indian Government allows these ladies of the Indian Nursing Service thirty rupees a month for the upkeep of their horses, and free conveyance of their animals to and from active service. This corps of nurses are all ladies of good social position, and have to undergo three years' training in a general hospital before qualifying.—*Indian Public Health.*

SEA SICKNESS.—A hypodermic injection of $\frac{1}{120}$ grain of sulphate of atropia and $\frac{1}{60}$ grain of sulphate of strychnia is recommended (Girard) as a specific for sea sickness. The injection to be given at the commencement of voyage or when the sea commences to be rough.

X-RAY BURNS.—At the 337th regular meeting of the New York Dermatological Society, held November 28th, 1905, the subject of X-ray burns was taken up, and Dr. Henry G. Piffard, Emeritus Professor of Dermatology in New York University, said (*Journal of Cutaneous Diseases*) "that he had obtained the most benefit in treating these conditions from antiphlogistine, chloride of zinc, high frequency current and ultra-violet rays."

WE regret to notice the death of Lieut. Waller H. Hills, R.A.M.C., of cholera, at Cawnpore. The deceased officer was only 28 years of age, but was already extremely popular, alike with his patients and his brother officers.

Personal Notes.

INDIAN MEDICAL SERVICES.

India Office: Arrivals of Indian Medical Officers in London.—Lieutenant-Colonel W. A. Lee, Lieutenant-Colonel M. Collie, Major T. D. C. Barry, Colonel H. Hamilton, C.B.

Extensions of Leave.—Captain H. R. J. Rainier, 4 m., Med. Cert.; Captain T. H. Delaney, 6 m., Med. Cert.

Leave.

Captain W. Collinson, 1 y. general leave.
Captain W. B. Turnbull, priv. leave, 3 m.
Major W. J. Buchanan, Insp. Gen. Jails, Bengal, priv. leave, 2 m. 15 d.
Lieutenant-Colonel D. G. Crawford, priv. leave, 2 m. 27 d.

Postings.

Colonel O. Todd, R.A.M.C., to the Poona Division, and to act as P.M.O. Western Command during the absence of Colonel Trevor, on leave.
Captain H. J. Walton, Civil Surgeon, Manipuri.
Captain Knapp, services placed temporarily at disposal of Government of Burmah for employment in Jail Department.
Captain H. Ainsworth to officiate as Medical Adviser to the Patiala State.
Major C. H. James is deputed to accompany Sir Rangbir Singh, K.C.S.I., of *Patiala*, to Europe.
Mr. E. W. Payne officiates as Insp. Gen. Jails, Bengal.

Medical Notes.

GLANDULAR FEVER.

A good deal of interest attaches at the present time around this loosely named illness. In a medical man suffering from general enlargement of glands, with a series of skin lesions resembling a syphilide, Drs. Stengel, White and Evans, of Philadelphia, found that syphilis was negatived, *Spirochæta pallida* was not found, but a streptococcus resembling one met with in horses and causing glandular fever and also epidemic coryza in these animals, was detected in the patient's blood, glands, and tonsils

ISTHMIAN CANAL COMMISSION.

In his report for May, 1906, Colonel W. G. Gorgas states that during the month in question there was but one case of yellow fever in the Zone. Pneumonia continues to be by far the most common cause of death amongst the men employed on the Canal work. Malaria is less prevalent, beri-beri is decreasing, and the general health is excellent in all parts of the Zone of work.

DR. NOVY, at the meeting of the Association of American Physicians, said he had prepared a serum capable of immunising against relapsing fever, and curative if given in early stages. We anxiously await further reports on this announcement.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"The Philippine Journal of Science," May, 1906.

Tyzzer, E. E., "The Histology of the Skin Lesions in Varicella."

Whifford, H. N., "The Vegetation of the Lamao Forest Reserve."

Bacon, R. F., "The Waters of the Crater Lakes of Taal Volcano, with a Note on some Phenomena of Radio-activity."

Lewis, G. N., "Concerning Silver Oxide and Silver Sub-oxide."

The Suppression of Malaria at Ismailia.

"Suppression du Paludisme à Ismailia" (The Suppression of Malaria at Ismailia). Suez Canal Company, 1906.

The object of this pamphlet is to demonstrate the methods by which Ismailia has been completely cleared of malaria.

Ismailia, which was founded by de Lesseps in 1862, on the banks of Lake Timsah, midway between the Mediterranean and the Red Sea, has now a population of 8,000 inhabitants.

Malarial fever suddenly appeared in this town in 1877 (up to which time it was noted for its healthfulness), and spread to such an extent that in 1886 nearly all its inhabitants had suffered from ague. On several occasions the Suez Canal Company endeavoured to arrest the development of malaria at Ismaila, but without any appreciable results. In 1901 a fresh attempt was made by Prince Auguste d'Arenberg, the President of the Company, which was more in accordance with the ideas which had just then been published on the part played by mosquitoes in propagating malaria. This attempt has met with complete success, for after two years' efforts all trace of malaria has disappeared from Ismailia.

The object of these remarks is to give some general idea as to the nature of the work undertaken and of the measures adopted which enabled this result to be obtained.

[The natural and medical histories of malaria are now so well known that they need not be mentioned here.]

The researches initiated by Prince d'Arenberg, in the spring of 1901, were undertaken with a view to the possible methodical destruction of mosquitoes at Ismailia, and pending the results of these studies the prophylactic use of quinine was widely employed amongst the inhabitants, the employees who suffered from malaria were medically treated gratuitously and received full pay whilst on the sick list.

Briefly stated, the studies made during the years 1901 and 1902 were mainly directed to the four following main points:—

(1) An examination of the adult perfect Anopheles.
(2) An examination of Anopheles larvæ.
(3) An examination of ordinary mosquitoes.
(4) An examination of the ground levels, with a view to the possibility of causing the stagnant waters to disappear.

The results obtained were as follows:—

(1) The dangerous season commenced about July, and one of the first centres of production for Anopheles mosquitoes was situated to the east of the town; at the same time no Anopheles were to be found either in the European or in the Arab quarters, although the whole town was afterwards invaded. The specimens captured were afterwards found to be *Anopheles pharoensis* and *A. chaudoyei.*

(2) It was definitely proved that the reproduction of the Anopheles mosquitoes was carried out exclusively in the pools and smaller shallow ponds which were to be found everywhere, and that these were filled on the rising of the Nile, although they subsequently became dried up.

(3) The ordinary mosquitoes belonged to the genera *Culex* and *Stegomyia*, of which there were numerous species; both of these generic forms went on increasing their numbers nearly all the year round, in the cesspits, ponds, garden water-ways, and cisterns, &c., as well as in those collections of water where Anopheles larvæ were found. Experiments were made as to the destructive action of petroleum spread over the waters which contained larvæ, and also as to the quantities required for each square yard of surface to ensure efficiency of result; the effect of salt-water and of sea-water on larvæ and nymphæ showed that these could at once be killed by the water of Lake Timsah.

(4) In order to destroy the Anopheles it would be necessary to do away with all stagnant collections of water in which the larvæ of these mosquitoes had been found, and a careful survey of the town and its neighbourhood showed that this would not be a very costly undertaking.

To complete these observations, Dr. Pressat (one of the Company's surgeons) was sent specially to Italy to study the latest methods of malarial research work, and Major Ross was specially invited the following autumn to visit Ismailia and to favour the Company with his advice, which was to use every effort to *ensure total protection for Ismailia from malaria* by the destruction of all the mosquitoes, as this task appeared to be a feasible one. Immediately on the receipt of Major Ross's report, a conference was specially held to propose definite measures and the means of applying them, and it was decided that the destruction of the Anopheles was first of all to be carried into effect, and afterwards that of the other mosquitoes.

Destruction of Anopheles.—The search for Anopheles larvæ revealed three dangerous foci close to the town: (1) To the east, the marsh of Abou-Rahan; (2) to the west, the small ponds, open drains for irrigation, and pumping-stations for the cultivated land near Nefiche; (3) to the south, near the northern bank of Lake Timsah and close to the bathing sheds, some collections of water which were formed only during the rise of the Nile.

The measures adopted were briefly as follows:—

The great marsh was intersected with deep channels which were stocked with fish, the reeds were removed, and the soil (wherever this was possible) was levelled, all depressions being filled up with sand; the smaller ponds and swampy spots were all filled in, the irrigation drains were cleared and deepened, and also stocked with fish, such as eels, mullet, and a species locally known as *chaba'r* (*Tilapia gallilea*).

Destruction of Ordinary Mosquitoes.—The works undertaken for the destruction of Anopheles also helped to bring about that of Culex and Stegomyia outside the town, but those inside the dwellings had yet to be dealt with. This task did not offer any great difficulty, as it consisted in the periodical emptying of all receptacles for water, wherever this was possible, or of spreading petroleum on the water if the receptacles could not be emptied.

The town of Ismailia was therefore divided into six districts (one for each week-day), and every house was inspected once a week, and on the same day of the week, by a squad of three Arabs commanded by an European, who were told off exclusively for this purpose. During this inspection every receptacle for water, including the ornamental garden ponds, had to be emptied and dried in the presence of the chief of the squad, and the inhabitants were cautioned against immediately refilling the emptied receptacles, as this might revive the half dried up larvæ. The cesspits at the same time were treated with a mixture consisting of one part of heavy petroleum to three parts of lamp petroleum, in the proportion of one glassful to every square yard of surface. [Before commencing these petroleum operations, all the vent-holes had been covered over with metallic gauze to prevent the escape of mosquitoes, which would otherwise have been driven away by the smell of the petroleum.] The Company had also previously obtained Government sanction for the sanitary squad to enter into the Arab dwellings; but as the inhabitants were put to no expense, and had no work imposed upon them, they readily submitted to this weekly inspection, and soon volunteered their help in applying the measures adopted.

Cost. Initial Expenses.—The filling in of the ponds and drainage of the marsh land cost about £2,000 altogether.

Permanent Expenses.—The upkeep of the drains (cutting weeds and reeds, &c.) in the neighbourhood of the town costs £312 per annum; the petrolage of the cesspits and blind wells and the filling in of local puddles in the town itself costs £420 annually, or a total yearly expenditure of £732.

Results.—Since the commencement of 1903 the common *mosquitoes have disappeared from Ismailia*, and all the inhabitants have been able to dispense with their mosquito-nets, which are so troublesome and anti-hygienic in hot climates. Since the autumn of 1903 not a single Anopheles larva has been found in the protected zone, which now extends for nearly a mile all round the town.

Since 1902 malarial fevers have shown a manifest decrease, and since 1903 *no fresh case of malaria* has been notified in Ismailia.[1]

It must, however, be noted that adult Anopheles are still occasionally found in the autumn in Ismailia, probably driven in from a distance by certain winds; but that they constitute no danger is proved by the disappearance of fever from the town.

Of all the hypotheses put forward to account for the invasion of malaria in 1877, the most probable one is that Anopheles have existed from all time in this region, but that the sudden appearance of ague in 1877 was due to the arrival of malarial patients at Ismailia. At this time the Ismailieh Canal was dug, and many Italians were employed on this work, and probably several of them had already suffered from ague in their own native country.—J. E. N.

[1] 1900 .. 2,050 cases (old and new, combined).
1901 .. 1,990 ,, ,, ,,
1902 .. 1,550 ,, ,, ,,
1903 .. 225 ,, ,, ,,
1904 .. 90 ,, ,, ,,
1905 .. 55 ,, (55 old, 0 new).

Notices to Correspondents.

1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the JOURNAL OF TROPICAL MEDICINE should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communications.

BERI-BERI—A RESTATEMENT AND REPLY TO SOME CRITICISMS.

By Hamilton Wright, M.D.

Before dealing with some recent work on beri-beri and criticisms of my own views as to the nature, &c., of the disease, it may be well to restate in epitome what the latter are. This will save reference to brochures which may not be readily available.

Clinical Aspects.

After several years of exhaustive etiological, clinical, and pathological researches on beri-beri, together with a review of the work of those who had preceded me in the study of the disease, the following conclusions were formulated as to its cause, onset, course, classification and termination :—

That beri-beri is, in its origin, an acute infectious disease. That it is independent of food regarded as food, or of any micro-organism whose special habitat is a foodstuff. That on the contrary, it is caused by a specific bacillus which is to be found under those general conditions which govern most specific micro-organisms. That, generally speaking, the disease begins in those enjoying good health by more or less pronounced symptoms suggestive of indigestion. That these symptoms (gastro-duodenal syndrome) consist of oppressive feelings or pain referred to the stomach, dilatation of the latter and of the duodenum, with consequent bulging of the epigastrium, vomiting and perhaps diarrhœa. That this syndrome precedes any other symptom of beri-beri by a few hours or days, and that it marks the multiplication of the specific bacillus and the elaboration of its extra-cellular neuro-toxin in the contents of the stomach and duodenum. That the gastro-duodenal syndrome is constantly and soon joined by signs of the acute poisoning of the nervous system as the result of the absorption of the specific virus into the circulation, *i.e.*, there are anæsthesia, flaccid paresis of varying extent, œdema and cardiac irritability. That this gastro-duodenal syndrome may either subside or intensify as the poisoning of the neurones proceeds. That the acute poisoning of the neurones reaches a maximum about the twentieth or thirtieth day and then begins to subside and finally disappear. That during the development and presence of the gastro-duodenal syndrome there is probably a continuous secretion of the specific toxin, and that the syndrome, together with the rapidly spreading acute poisoning of the sensoro-motor and autonomic neurones make up acute beri-beri, or beri-beri proper.

Further, that if such cases of acute beri-beri are not treated by strict rest of the acutely poisoned neurones, the symptoms of nerve poisoning do not clear up on the elimination of the causal organism and its toxin (about the third to fourth week from the onset), but resolve into more narrowly confined symptoms which then more or less rapidly change from the acute toxæmic type to a chronic degenerative type. That is, the acute flaccid palsy (to take the most obvious symptom) insensibly resolves to chronic atrophic paralysis as the result of an inertia degeneration imparted to the neurones by the specific neuro-toxin, active only in the acute stage of the disease. I pointed out that this chronic stage of the disease is not beri-beri proper, but simply a degenerative paralysis residual to the more extensive toxæmic palsy of acute beri-beri or beri-beri proper. I feel bound to be somewhat tautologic on this question, because what seemed to many to have been a plain statement has nevertheless been misconstrued by recent critics of my views. So much for the clinical aspect of beri-beri.

Pathological Aspects.

The pathology of beri-beri was studied with strict regard to the clinical signs and duration of the disease. A considerable number of new facts were elicited, and these, with the data of the older observers, were co-ordinated as logically as possible. In regard to the pathology of beri-beri the main conclusions were as follows :—

That nearly all cases of beri-beri, fatal in the acute stage of the disease (first to sixth week), exhibit a necrosis of the gastro-duodenal and neighbouring mucosa along with the signs of inflammation. That in association with this gastro-duodenitis there was found a rod-shaped bacillus of constant morphological character. That, taken with the onset of the disease by a gastro-duodenal syndrome, it seemed pretty conclusive that the gastro-duodenitis would have to be regarded as the primary lesion of the disease, and that the constant presence of the rod-shaped bacillus was suggestive at least that we were dealing with a specific organism. Further, that the morbid anatomy of the acute stage of the disease was distinctly different from that of what I termed the residual stage. That in the former classes of cases the lesions were of the nature of an acute poisoning of the peripheral terminations of the neurones (no signs of degeneration in them) and that the changes in all other organs were secondary to such an acute poisoning. That is, there is dilatation of the right heart (no hypertrophy whatever), a small amount of fatty degeneration only, and more or less passive congestion of lungs, spleen, liver and kidneys (no necrosis in these organs at all). On the other hand, that in cases of residual paralysis (from three months' to several years' standing) there is not found a gastro-duodenitis except in cases reinfected. That the peripheral terminations of the involved neurones now show various degrees of true inertia degeneration, Wallerian in appearance, and that this degeneration has migrated towards the trophic centres. That there are found some signs of chronic derangement in the body organs, namely, dilatation of the chambers and true hypertrophy of the cardiac muscle, coextensive with the amount of degeneration in the cardiac nervous system, and the time which has elapsed since the degeneration set in ; chronic emphysema and even slight fibrosis of the lungs, with signs in the liver, kidneys and spleen of the effects of prolonged passive congestion.

Classification of Beri-beri.

Upon both clinical and pathological data there was propounded a new classification of beri-beri which I hoped would be regarded as scientific rather than merely descriptive. The older classifications took note

of some one feature of the disease, such as œdema, or muscular atrophy, and the disease was then written of as wet or dry beri-beri. There follows the new classification :—

Acute pernicious beri-beri, which is rapidly fatal because of the impact of the specific toxin on the terminations of the entire cardiac nervous system. In this class of cases there may, of course, be other signs of the acute disease: varying degrees of œdema, flaccid palsy, vaso-motor disturbance, &c. But the main features are that the onset is sudden, the cardiac neurones bear the brunt of the poison, and the cases are rapidly fatal.

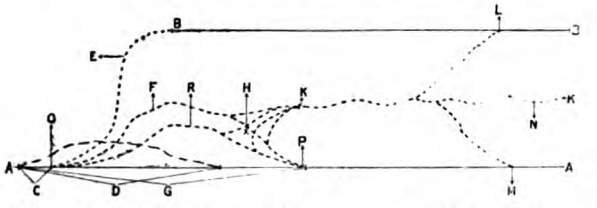
Acute and subacute beri-beri, in which the onset is more or less sudden and well marked, but in which, though there are many signs of neuronal poisoning, the virus is not specially incident on the cardiac nervous system.

Beri-beric residual paralysis, or the chronic stage of the disease due to an inertia degeneration of various kinds of neurones, from the impact of the virus in the acute stage of the disease.

These different class names, it was suggested, may be modified so as to indicate which particular neuronal system is involved, thus :—

Acute	cardiac, motor, sensoro-motor, or vaso-motor	beri-beri.
Beri-beric residual	cardiac, motor, sensoro-motor, or vaso-motor	paralysis.

Chronic beri-beri as a classifying term for cases of residual paralysis was avoided, because it implies that the causal agent is still at work. Post-beri-beric paralysis was avoided, because it implies that the atrophic paralysis of the disease followed some morbid constitutional state, minus paralysis. I have drawn attention to some striking analogies between beri-beri, as I conceive it, and diphtheria, principally that beri-beri as diphtheria appears to be due to a bacillus which multiplies locally in the vicinity or actually in a mucous surface, and produces its remote effects on the nervous system (constant in beri-beri, casual in diphtheria, however) through the agency of an extracellular neuro-toxin. Some commentators on my views, forgetting that there is no exact analogy in Nature, have, nevertheless, converted my analogy into an exact parallel. In doing so they accuse me of stating that beri-beric paralysis is always post. Above I have restated my position in this matter, I hope clearly and beyond further misconception. Perhaps the following graphic illustrations will make more clear this conception of beri-beri :—



KEY.— AA, Health line; BB, death line; C, prodromal stage of more or less marked gastro-duodenal symptoms; D, more or less well-marked gastro-duodenal syndrome, suggesting multiplication, of specific bacillus, elaboration of its toxin and absorption of it into blood stream, with consequent poisoning of neuronal terminations; O, first evidence of neuronal poisoning developing suddenly into acute pernicious beri-beri (E), which ends rapidly in death at (B), into acute and subacute beri-beri (F and R), which end in recovery at (P); G, combined gastro-duodenal and acute neuronal symptoms making up beri-beri proper, or the acute disease; H, more or less rapid passing of the acute poisoning of the neurones into an inertia degeneration, which occurs in a large number of cases, thus constituting (KK), beri-beric residual paralysis; L, termination of the residual paralysis in death from cardiac exhaustion or some intercurrent affection; M, termination of residual paralysis in recovery; N, continuation of the residual paralysis indefinitely.

Above I have spoken of this theory, pathology, and classification of beri-beri as generally applicable. Does it, however, apply to those cases of beri-beri which follow parturition, surgical and other wounds, and which occur in children at the breast of mothers suffering from the acute disease. I have already answered this question elsewhere, but it may be restated. If the central fact of the theory is considered, namely, that beri-beri is caused by a specific bacillus locally confined, which produces its remote effects on the nervous system by means of an extracellular diffusible neuro-toxin, it will be clear that such an organism may act in a wound as well as in a mucous surface. Further, that acting in a parturition wound enough toxin may be absorbed not only to cause the acute disease in a mother, but also in her nursing child by secondary absorption. It might be urged that the experimental translation of human beri-beric blood to monkeys does not produce signs of beri-beri in them. But obviously it is one thing to translate a small quantity of blood from a human beri-beric to a monkey, and another, the almost constant translation of the beri-beric virus which would take place between an infected mother and her suckling infant. In the latter case the virus would be constantly reinforcing that previously absorbed, while in the former the small quantity of virus contained in the amount of blood that could be translated would be quickly diluted and neutralised.

The data on which all of these conclusions were based were published several years ago. Naturally it has taken time for other workers to confirm them *in toto* or in detail, or to deny them. Observations have, however, recently accumulated rapidly, and it is now proposed to examine them and see if they seriously impair my own and the reasoning founded on them.

Replies to Criticisms.

Before proceeding, some ground must be cleared by reference to certain misstatements made by Dr. H. E. Durham in the *Journal of Hygiene*.

That author, by obviously personal strictures, attempted to cast doubt on the validity of certain special observations which I had made in the Federated Malay States. I have not before taken notice of his remarks, for it seemed to many that he was quite unfair. Perhaps if I state that Durham worked in my laboratory for nearly a year after my views on beri-beri had been submitted, and that on publishing what purported to be his own observations he failed to acknowledge the fact, and that, as is well-known to

those competent to discuss beri-beri, he, by his actions in the Federated Malay States, put himself out of court as a possible critic of beri-beri work done there, the matter may be brought to rest. I should not essay even this defence of my work against Durham's attacks were it not for the fact that some fair-minded critics have echoed him.

To turn now to more serious subjects. There has been considerable negative criticism of my conclusions as restated above.

Dangerfield's extensive brochure on beri-beri, published in Paris, 1905, is on the whole a negative comment on my views, inasmuch as he has submitted data on which he affirms that beri-beri is essentially a bacteræmia. He puts forward a micrococcus as the form of organism that exists in the blood stream and causes the disease. In 1900-1901 I made fairly exhaustive research of the blood of all classes of beriberics, and failed to find an organism in the flowing blood. Dr. C. W. Daniels ("Observations in the Federated Malay States on Beri-beri," London, 1906) has more recently made a similar research which was wholly negative. I shall shortly record an even later examination of the peripheral blood of acute beriberics by Wise, in which no organism of any kind was found. Finally, Drs. Hunter and Koch ("A Research into the Etiology of Beri-Beri," Hong Kong, 1906) have published a very thorough observation of the blood of beri-berics, and have made inoculation experiments which show conclusively that beri-beri is not a bacteræmia. On the whole, Dangerfield's conclusion, and with it his negative evidence against my view that beri-beri is originally an acute toxæmia, beginning in a local primary lesion, cannot be accepted.

Dr. C. W. Daniels has put forward some negative criticism of my view of the nature of beri-beri. Unfortunately it is founded on an entirely erroneous conception of both my working theory and classification of the disease. Daniels credits me as follows: "Dr. Hamilton Wright goes so far as to propose the limitation of the term beri-beri to the intestinal condition, and to describe what is at present known as beri-beri as post-beri-beric neuritis."

I have not, of course, proposed any such limitation of the term beri-beri, nor have I ever used the wholly misleading term, post-beri-beric neuritis. It is not necessary to repeat what I have restated above on this side of the beri-beri question. Having mistaken my words, Daniels would controvert my views as to the nature of beri-beri by evidence which, properly interpreted, seems to me to only support the latter. For instance, he states: "In cases admitted with beriberi, loss of appetite is common, and vomiting occasionally does occur; while distension of the epigastrium is quite a feature in the diagnosis. As these cases have quite other definite symptoms of the disease, and had usually been ill for several days, the symptoms were during the early stages of ordinary beri-beri and not during a prodromal stage."

I have never claimed more for the early, acute stage of beri beri. Had Daniels read me clearly, he would have seen that the gastro-duodenal symptoms of his cases were part of what I have termed acute beri-beri. Had he seen his cases early enough he would probably have found, as others as well as myself have pretty constantly found, that the gastro-duodenal symptoms were prodromal, as well as an accompaniment of acute beri-beri. His conclusions on this important point would then no doubt have chimed with mine, that beri-beri onsets with a gastro-duodenal syndrome, indicating the probable site of action of the specific cause.

In a further criticism of my view as to the primary lesion of beri-beri, Daniels submits a singular pathological conception. He states that the lesion of the gastro-duodenal mucosa in acute beri-beri, which he appears to have found pretty constant, is "not of an inflammatory nature such as we should expect to find in a primary lesion, but such as occur as secondary lesions, hæmorrhages, and congestions."

This view is not borne out by any published evidence that Daniels made an acceptable examination of the gastro-duodenal mucosa of acute or other beriberics. He appears to have autopsied thirty-four cases of beri-beri, thirteen of which exhibited ecchymoses and congestions of the gastro-duodenal mucosa ("The Diseases of British Malaya," Studies from Institute Medical Research, F.M.S., vol. iii., part 1). He does not claim to have been informed on the clinical histories of these cases, and there is no detailed statement of the microscopical appearances of their gastro-duodenal mucosa. I maintain that one may be grossly misled by the mere macroscopical observation of any morbid organ, and that no one is competent to generalise on such data. I may be wrong, but I am nevertheless forced to conclude that Daniels' criticism, as just quoted, is based on what he has read into my very detailed description of the macroscopical and microscopical state of the gastro-duodenal mucosa of many cases of acute beri-beri whose clinical history was known and given.

I hoped that I had made it perfectly clear that the chief lesion in the gastro-duodenal mucosa of acute beri-berics is a necrosis. There is, besides, more or less precipitation of fibrin, some small-celled and polynuclear leucocytic invasion, and spots and rings of brilliant congestion due to dilatation of capillary terminations. Actual hæmorrhages are rare, and just as rarely there may be extensive hæmorrhagic erosions. Mucosal erosions may, however, be common. Ulceration I have not seen.

According to the singular pathological conception enunciated by Daniels, this lesion in acute beri-beri, and the essentially necrotic lesions of diphtheria, cholera and tetanus, cannot be primary. It does not appear to me that Daniels' conclusion on this point can be accepted.

Daniels and others would attribute what I regard as the primary lesion of beri-beri to the action of a virus on the vagal terminations in the gut, without attempting to account for the early selective action of the poison. By similar reasoning, did we not know better, we might account for the primary lesion of diptheria as due to the action of a virus on the neuronal terminations in the palate, pharynx and larynx. It appears to me to be better pathology to reason that, given a constant primary lesion caused by a neurotoxin-producing bacillus, it will be the neuronal terminations distributed to the site of the primary lesion

which will in time first succumb to the effects of the toxin.

The rest of Daniels' views as to the etiology, &c., of beri-beri are almost purely speculative, and so do not call for reply. He does not appear to have been able to watch the disease develop in healthy subjects, and his limited observations on morbid anatomy do not seem to have been made with a knowledge of the clinical history of his cases. He, however, arrives at an important general conclusion after examination of ground which I had thoroughly explored, namely, that "beri-beri is an infectious disease. As a rule a short period of incubation and a period of exposure of less than three months is requisite for full development of the disease where the 'endemic index' is high."

It will shortly appear that this general conclusion to which I was forced, to which Daniels has been forced after an examination of much data collected by others, and to which observers like Scheube adhere, is denied *in toto* by Hunter and Koch.

Drs. Hunter and Koch's Researches.

The most ambitious recent attempt to add to our knowledge of beri-beri is that made by the just referred to authors, Drs. Hunter and Koch, in "A Research into the Etiology of Beri-beri," Hong Kong, 1906.

These observers have canvassed the whole issue as laid down in my own investigations of the disease. It will be well to continue this line in my reply to their criticisms.

First in regard to the question of etiology. The above authors attempt to show that beri-beri is not an acute infectious disease. The first facts submitted are in a description of "An Outbreak of Beri-beri in the Po Leung Kuk." A mild form of the disease was not brought under control by "thorough and complete disinfection of the buildings. This was carefully done by the staff of the Sanitary Board, and the walls were completely lime-washed thereafter, and the floors scrubbed with a solution of strong carbolic acid." Because these sanitary measures were ineffective, Hunter and Koch conclude that beri-beri is not infectious in nature. Of course, so sweeping a conclusion is not warranted by the facts of the case. The observers do not appear to have disinfected the clothes or bedding of the inmates. They make no mention of having corrected the personal hygiene of the latter, an important matter when there was, as in this instance, an overcrowding of Orientals. The food supply does not appear to have been examined for *materies morbi*, and during the continuance of the outbreak no effort was made to prevent new arrivals from introducing new infection from some endemic focus outside the Po Leung Kuk.

In all observations made in the Kuala Lumpur gaol, which Hunter and Koch would refute, the circumstances just enumerated were carefully looked to. The Kuala Lumpur observations extended over a period of more than two years altogether. The focus of infection (granting infection for the time being) was by a process of rigid exclusion narrowed to the cells of the gaol, and finally to certain of these cells almost alone. It will be clear, therefore, that Hunter and Koch's observation in this instance was inadequate to exclude beri-beri from the category of infectious diseases.

To clinch what Hunter and Koch regarded as a capital fact against the infectious nature of beri-beri, they proceeded to repeat my observation that monkeys may contract beri-beri when placed in a focus of the disease.

"Description of the Experiment A, 1-11-111. The rooms of the Po Leung Kuk, in which the majority of cases of beri-beri had occurred, were reserved for this test. The rooms were left in exactly the same condition as when they were used by the inmates of the Po Leung Kuk. Two monkeys were placed in each room, and in order to facilitate the onset of the disease the windows of the rooms were kept shut, and the light excluded as far as possible."

The monkeys, after a prolonged incarceration, did not develop beri-beri. Hunter and Koch, therefore, conclude that "The incarceration for months of monkeys in rooms presumably infected with the so-called beri-beri virus failed to induce the occurrence of the disease in them. We were unable to confirm the results of Hamilton Wright."

It must be plain to even the most casual reader that this attempt to work along the lines of my monkey experiment was a failure. The conditions of Hunter and Koch's experiment were almost indefinitely wide of the conditions under which my own observation was carried out in the Kuala Lumpur Gaol. As shown above, Hunter and Koch had by no means proved that it was the living-rooms of the Po Leung Kuk (in which they confined their monkeys) which contained the virus of beri-beri, as had been proved in regard to the cells of the Kuala Lumpur Gaol. Further, they were dealing with an institution in which only the mildest type of beri-beri had been observed, while the Kuala Lumpur Gaol had for years been a veritable hotbed of the most severe type of the disease. For instance, in ten or twelve of the Kuala Lumpur cells there was placed as many healthy Chinamen who had been roving the country as gang robbers. These men never left the cells from the time of incarceration until they contracted beri-beri. Inside a month eight of the Chinamen contracted a most severe type of acute beri-beri, while one of them died of the acute pernicious form. Again, Hunter and Koch incarcerated their monkeys in rooms with a floor space ranging from 401 to 902 square feet. The cells of the very lethal Kuala Lumpur Gaol, in which my observation was made, had a floor space of about 50 square feet. This alone was a great difference in the conditions of the two experiments, even granting that Hunter and Koch had proved by exclusion that the rooms of the Po Leung Kuk were infected. All facts considered, it does not appear that Hunter and Koch's observation on monkeys was well planned, or that it was adequate to exclude any part of my own. It certainly does not exclude beri-beri from the category of the acute infections.

Under the heading of "Feeding Experiments, B, 1-111," these observers make the following statement, and then, on the contained reasoning, proceed with certain experiments: "As certain observers, as Pekelharing and Winkler, Gerrard and others, claim to have found micrococci, &c., in the blood stream of beri-beri patients, feeding animals with the blood of such cases seemed to afford the best opportunity

for a successful mode of conveyance of beri-beri from man to animal. By this method the organisms said to be present in the blood would reach that part of the gut, namely, the gastro-duodenal mucosa, alleged to be the site of primary beri-beri infection, and in susceptible animals set up the disease. It seemed to us that, by resorting to such experiments, the question as to the presence of a definite primary lesion in beri-beri, and our hopes of obtaining positive evidence of the transmission of the disease to monkeys by this method were strengthened by the publication of Wright dealing with natural infection in monkeys incarcerated in presumably infected prison cells."

The reasoning of this paragraph does not appear sound to me. In effect, Hunter and Koch state that A. has a theory that beri-beri is caused by a bacillus which never extends into the blood stream, but acts locally in a mucous membrane, and produces its remote effects by means of an absorbable toxin; that is, the disease is a toxæmia. B., on the contrary, has a theory that beri-beri is caused by a micrococcus which gains the blood stream through the skin; that is, the disease is a bacteræmia. C., however (Hunter and Koch), propose to prove that A. is wrong in regard to his locally acting bacillus by feeding animals with blood supposed to contain the skin-piercing micrococcus of B.

Comment on such reasoning is needless, and Hunter and Koch's "Feeding Experiments, B, 1-111," based on it, do not call for attention.

Hunter and Koch now proceed along more rational lines and attempt to show that animals fed with gastro-duodenal mucosa of fatal acute beri-berics fail to exhibit signs of the disease.

Their feeding experiments, E, 1-11-111, were made on monkeys by feeding one animal in each experiment with *one bolus* composed of boiled rice and broken-down gastro-duodenal mucosa. No signs of beri-beri followed after feeding with *one bolus*. Yet the authors conclude that the experiment was negative, so far as my view is concerned that beri-beri has as its primary lesion a gastro-duodenitis. The experiment was well conceived, but nevertheless wholly inadequate as the basis of any conclusion, in regard to beri-beri. The experimenters should have borne in mind the feeding experiments made with Koch's comma.

A further attempt was made by Hunter and Koch to induce beri-beri in animals by feeding them with spleen pulp, broken-down liver, medulla, cord, brain blood, &c., of beri-berics (feeding experiments, B, 11, pigs I. to VI. and one sheep). The amount of such materials that could be given to animals was small, of course, and the boluses were seldom or never repeated. No signs of beri-beri appeared. Therefore, conclude the authors, beri-beri may not be contracted through the gastro-duodenal mucosa. So far as I know the organs with which these animals were fed have never been claimed by me to contain the bacillus of beri-beri I have always maintained that the bacillus does not extend within the body. It must be plain, therefore, that this attempt to induce beri-beri was illogical, and that no fair deductions can be based on it.

It is gratifying to turn from Hunter and Koch's illogical feeding experiments to some of their really valuable inoculation work. After a repetition of observations made by the writer several years ago, more recently by Daniels, and still later, as I shall show elsewhere, by Wise, that in no stage of beri-beri is there a bacteræmia, Hunter and Koch conclude as follows: "The repeated sterile result after inoculating bouillon and agar tubes with appreciable quantities of freshly flowing (beri-beri) blood, demonstrates more or less clearly the non-bacteræmic nature of beri-beri." This does not, of course, prove that beri-beri is not an acute infection. It simply proves that it is not of the bacteræmic type of infection.

The authors clinch this observation by a failure to induce beri-beri in monkeys, sheep, calves, rabbits, &c., by inoculating them with beri-beri blood and vaccinating them with rubbed up beri-beric organs. But these experiments do not exclude beri-beri from the category of the acute infections. They only prove that beri-beri is not a bacteræmia. They have only a remote relation to my own view that beri-beri is an acute toxæmia. On this view the remote effects of the locally acting bacillus are induced by an absorbable toxin which circulates in the blood. Hunter and Koch might have hoped to induce some signs of beri-beri in their animals by carrying over in blood from beri-berics an efficient quantity of the circulating toxin. The small amounts of blood they were forced to use, however, would put out of consideration any attempt of this kind.

Where, as the result of their experimental observations, Hunter and Koch conclude that by culture no organisms are to be found in the blood stream of beri-berics they are correct and corroborate older observations of the same order. They are also correct when they conclude that beri-beri cannot be induced by the translation of beri-beri blood to lower animals, provided that they hold to the idea of a bacteræmia as the cause of beri-beri. When, however, on such data they conclude that beri-beri is not a toxæmia caused by a locally acting organism, they go astray. They do not appear to distinguish between the idea of a bacteriæmia and a toxæmia, or so it would appear from the above quotation from their work. They appear to have forgotten, too, that any quantity of a toxin which they might translate from the human to a lower animal would be quickly diluted and probably neutralised by the body juices of the latter. It is quite a different matter in the case of a child suckling a beriberic mother, as mentioned above.

I do not think that any one will, after a careful reading of Hunter and Koch's experiments, and the reasoning on which they were largely founded, conclude with them as follows: "These experimental researches, negative though they be, possess, in our opinion, great value, as they practically prove (how may a negative experiment practically prove?), in opposition to H. Wright and others, that in beri-beri we are not dealing with an infectious disease, but one with an entirely different etiology."

Turning now from Hunter and Koch's etiological to their clinical observations, it would appear that the latter were confined to the inextensive subacute outbreak in the Po Leung Kuk. Even in this experience of the disease we are not furnished with the particulars of individual cases. Only very wide

generalisations are made. There seems to have been no attempt made to study the disease under that prime condition, rest or comparative rest, which is demanded by the nature of the affection. The patients wandered at will. It is an axiom that the true features of an acute neuritis are obscured by adding to the original symptoms others due to use of the damaged neurones. I have shown that in onset, course, and termination beri-beri presents clinically many features of an acute infection. Hunter and Koch's clinical observations do not help us to form an opinion one way or the other on this question.

In regard to the pathology of beri-beri Hunter and Koch state: "The descriptions recently given by Hamilton Wright, Mott, and others are sufficiently extensive and minute to gratify even the most curious of pathologists."

Why, then, did they not accept that pathology and its classification into the acute and residual categories, a pathology which, so far as my own work was concerned, was based on not only extensive *post-mortem* examinations, but also on a thorough study of the cases before death. My attempt was to put the morbid anatomy of beri-beri on a scientific basis, to co-ordinate the appearance of an organ or set of neurones with the symptoms expressed by them during life. For years beri-beri cadavers had been conscientiously studied by Malcommsen, Scheube, Baelz, Ellis, and others; the only fault in their observation was that the lesions found were not brought into relation with the clinical signs at the time of death. Statements were made in regard to the heart, muscles, &c., that appeared to be positive for any stage of the disease. The literature was full of such general conclusions as that there is always cardiac enlargement in beri-beri; that the somatic muscles are greatly atrophied, &c. My own efforts showed conclusively that the pathologic lesion of beri-beri varied with the stage of the disease, and that the lesion of the acute stage of the disease was an entirely different affair from that of the residual stage of the disease (*vide supra* for an outline).

It appears to me that after the frank admission of Hunter and Koch that pathological curiosity had been satisfied, they should have refrained from tabulating their morbid anatomy without any relation to the clinical histories of their cases. They state: "It is to be regretted that in the majority of cases—cadavers—examined a history of illness was not ascertainable. This was due to the fact that most of the bodies sent for section were found in the streets, in deserted houses, or on the hillsides." Only vague generalisations may be made from morbid anatomy obtained under such conditions. And so we find that Hunter and Koch have given us the pathology of beri-beri as it may be found in any old text-book article on the disease. It cannot be accepted on their clinical or *post-mortem* work any more than on their etiological observations that beri-beri is not an infectious disease.

There is but one other point in Hunter and Koch's work that should be attended to. Writing on the classification of beri-beri, they remark that beri-beri exists in two forms: "the dropsical, moist or wet form, and the atrophic or dry form. Beri-beric residual paralysis is a term which has been used in an analogous manner, and with a similar meaning to diphtheritic paralysis. The pathology of the diseases being different, the comparison does not hold, and any attempt to introduce new varieties, names, &c., is to be deprecated."

Of course the disease does not present itself in two varieties. It presents itself in a multiplicity of varieties, depending upon the extent to which the different kinds of neurones are poisoned in the acute form, and the degrees of inertia degeneration which develop in them if they do not recover on the elimination of the virus of the disease. The terms wet and dry were tentatively used over fifty years ago, before the pathology of beri-beri could be satisfactorily studied. For Hunter and Koch to continue to use them is to confuse the subject, just as they confuse it by stating that the morbid anatomy is so and so without any relation to the clinical facts and stage of the disease. Further, the term beri-beric residual paralysis was not proposed on the assumption stated by Hunter and Koch. It was proposed for the exactly opposite reasons. It ought to prevent any one confusing the residual paralysis of beri-beri which follows a previous acute palsy with the post-paralysis of diphtheria which is not post to a previous different sort of paralysis, but to certain local and constitutional symptoms which make up the disease. The classification which was proposed for beri-beri (*vide supra*) was based on clinical and pathological data studied in close relation to one another. Hunter and Koch may regard it obliquely; yet they testify to its soundness by constantly using it in their description of experimental work, and in the one clear statement they make on the pathology of beri-beri.

Taking all of the above criticisms into consideration, they cannot be said to weaken the views which I have expressed (be they right or wrong) as to the nature, cause, course and termination of beri-beri.

MALIGNANT ANTHRAX ŒDEMA IN CENTRAL AFRICA.

By A. Yale Massey, B.A., M.D., C.M.(Tor.).

Medical Officer, Tanganyika Concessions, Ltd.

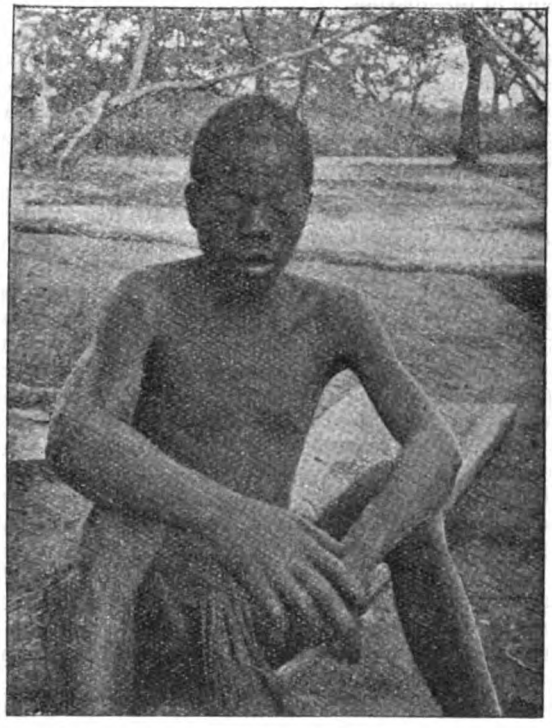
On March 14th, 1906, a black, aged 18, employed on the shed gold, carrying dirt in a bark basket, appeared at the hospital complaining of pain in his neck and shoulder. Examination revealed a slight general swelling above the right clavicle, and a very considerable swelling and œdema of the adjoining shoulder extending almost to the elbow. There was no abrasion of the skin. Temperature, 103° F. The patient did not appear to be very ill, his main trouble being that he could not use his right arm. During the next two days œdema increased and extended to the fingers which became very tense. The temperature fell to 101° F. 18th: The patient, instead of coming for treatment, went hunting mushrooms for food, saying he was all right. 19th: Proptosis of right eye and swelling of right face. 20th: Convulsions general, resembling epilepsy every couple of hours; breathing heavy; temperature normal. 21st: Proptosis marked in both eyes; left breast slightly swollen. 22nd: Unable to close the eyes completely; corneæ dry and anæsthetic; œdema of arm and hand slightly

reduced. Convulsions very frequent and always on being disturbed. No evidence of disease in the lungs. 23rd: Death.

Autopsy. — Decomposition was rapid. Serous cavities contained small amounts of fluid. Marked œdema of right arm, shoulder and neck. Spleen not enlarged. Deep glands of the right side of the neck much engorged.

Diagnosis.—The anthrax bacillus was not found in the blood before death, after more or less careful search. Fluid from the engorged cervical glands, after death, showed numerous anthrax bacilli, and mice inoculated with this fluid died in five days, their blood showing innumerable bacilli of anthrax.

Treatment. — Symptomatic with good feeding, stimulants and quinine. It is regretted that a supply



Photograph taken on March 21st, or eighth day of disease.

of Sclavo's anti-anthrax serum,[1] which has been used with such marked success in England and on the Continent, was not available.

Conclusions.—This is the first case of anthrax that I have diagnosed in a six years' practice in Central Africa. It is quite possible that some sudden deaths of unknown cause among natives may have been due to the *Bacillus anthracis*. That there should be marked external œdema without the pustule seems to be contrary to the rule. Infection may have been through the mucous membranes of the nasal fossæ, the mouth or the pharynx, to the deep cervical glands.

A noticeable feature was that the patient never took his illness seriously, and even when in a critical condition did not appear to feel very ill.

[1] Legge. Milroy Lectures. *British Medical Journal*, March 18th, 1905.

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THE

Journal of Tropical Medicine

AUGUST 15, 1906.

THE SIVEWRIGHT PRIZE.

THE prize given by Sir James Sivewright, K.C.M.G., M.A., LL.D., has been awarded to John D. Gimlette, M.R.C.S., L.R.C.P., of the Malay Native States, for his contribution entitled "The Puru of the Malay Peninsula," published in the JOURNAL OF TROPICAL MEDICINE on May 15th and June 1st, 1906.

THE BELILIOS PRIZE.

THE prize given by Raphael Belilios, Esq., has been awarded to Joseph Herbert Ford, B.S., A.M., M.D. (Captain, Assistant Surgeon, U.S. Army; Professor of Diseases of the Tropics in the Medical Department, Columbian University, Washington, D.C.), for his contribution entitled "The Treatment of Dysentery," published in the JOURNAL OF TROPICAL MEDICINE, July 15th, 1904, and to J. G. Berne, Captain, R.A.M.C., for his contribution entitled "The Treatment of Dysentery," published in the JOURNAL OF TROPICAL MEDICINE, August 1st, 1904.

THE ETIOLOGY OF BERI-BERI.

THE categorical reply of Dr. Hamilton Wright to critics of his well-known theory as to the nature, cause, course and termination of beri-beri, is interesting reading. That it will carry conviction to unbelievers is another matter; but all will agree that his formulated conceptions bear a scientific impress which cannot be passed over slightingly or without careful consideration. Drs. Hunter and Koch, of Hong Kong, have given the matter their earnest attention, and that they have approached the subject in a truly scientific spirit is abundantly apparent from the detailed criticism of their published report which Dr. Hamilton Wright has found it necessary to bestow upon their work.

Hamilton Wright's contention is well set forth in the article we publish to-day, and we refer our readers to the opening paragraphs of his contribution for a further enunciation of his views. Shortly, it may be stated, that according to Dr. Hamilton Wright beri-beri is, in its origin, an acute infectious disease. It is caused by a specific bacillus having its habitat in the gastro-duodenal tract; the bacillus induces a necrosis of the mucosa of that part of the alimentary canal and "a toxin is developed, and the syndrome, together with the rapidly spreading acute poisoning of the sensoro-motor and autonomic neurones, make up acute beri-beri, or beri-beri proper." This is a clear, definite and logical position, and only requires for its establishment clinical and pathologic confirmation. This confirmation Dr. Wright maintains that he has established, and his opinion is shared by not a few.

Drs. Hunter and Koch tested Dr. Hamilton Wright's views on beri-beri by extensive pathological and bacteriological investigations, and their conclusions are:—

(1) There is no evidence that beri-beri is an acute specific infectious disease.

(2) No micro-organism, of the hitherto described forms, has been found in any organ or tissue of a beri-beri patient or cadaver which could be brought into causal relationship with the disease.

(3) Experimentally it has been found impossible, by any method, to call forth the disease in any animal.

(4) In our experience true beri-beri does not exist in monkeys infected either naturally or experimentally.

(5) Beri-beri, as the result of our investigations, would appear to be non-micro-organismal in nature. We are inclined to bring some chemical poison into causal relationship with the disease.

(6) Our results are in direct opposition to those obtained by Dr. Hamilton Wright.

How the conclusions are answered and dealt with by Dr. Hamilton Wright will be found in his article published in the current issue.

That beri-beri is a serious malady in Hong Kong there can be no doubt, for Dr. J. C. Thomson, who is in charge of the Tung Wah Hospital, Hong Kong, states that "Beri-beri is a most deadly disease, and is now (1905 report) alarmingly prevalent in the colony."

A STUDY OF THE CAUSE OF SUDDEN DEATH FOLLOWING THE INJECTION OF HORSE SERUM. By Milton J. Rosenau and John F. Anderson, Hygienic Laboratory, United States Public Health and Marine-Hospital Service.

In their introduction to this enquiry the authors state that: "It has long been known that the blood of certain animals is poisonous when transfused or injected into certain other species.

"Many instances might be cited showing that the blood serum of one animal has poisonous properties when injected into an animal of another species. But the blood serum of the horse apparently lacks such poisonous action. Very large quantities of the blood serum of the horse may be injected into man, rabbits, guinea pigs, and many other animals without serious inconvenience, except occasionally a slight reaction at the site of inoculation.

"In a certain proportion of cases the injection of horse serum into man is followed by urticarial eruptions, joint pains, fever, swelling of the lymph nodes, œdema, and albuminuria. This reaction, which appears after an incubation period of eight to thirteen days, has been termed by Pirquet and Schick the 'serum disease.'

"In exceptional instances sudden death has followed an injection of horse serum in man.

"These studies were taken up in October, 1905, in order to throw light upon the cause of this unfortunate accident. We have shown that ordinarily horse serum is a comparatively bland and harmless substance when injected into certain animals; but these animals may be rendered so susceptible that an injection of horse serum may produce sudden death or severe symptoms. For example, large quantities of horse serum may be injected subcutaneously or into the peritoneal cavity of a guinea pig without apparently causing the animal the least inconvenience. However, if a guinea pig is injected with a small quantity, say $\frac{1}{250}$ c.c., of horse serum and after the expiration of a certain interval is again injected with the horse serum the result will probably be fatal. The first injection of horse serum has sensitised the animal in such a way as to render it very susceptible to a toxic principle in horse serum. It is probable that when the guinea pig is injected with the first, or sensitising, quantity of serum the strange proteid contained in the horse serum develops in the body of the guinea pig 'antibodies' which, when brought into contact with more horse serum given at a second injection, produce either a union or a reaction, which causes the toxic action.

"A certain time is necessary to elapse between the first and second injections of horse serum before this toxic action is able to manifest itself. This 'period of incubation' is from ten to twelve days, and corresponds suggestively with the period of incubation of the serum disease which Pirquet and Schick place at eight to thirteen days.

"Guinea pigs may be sensitised with exceedingly small quantities of horse serum. In most of our work we used quantities less than $\frac{1}{250}$ cc. and we found in one instance that $\frac{1}{1,000,000}$ cc. of horse serum was sufficient to render a guinea pig susceptible.

"It also requires very small quantities of horse

serum, when given in a second injection, to produce poisonous symptoms. One-tenth c.c. injected into the peritoneal cavity is sufficient to cause the death of a half-grown guinea pig. One-tenth c.c. of horse serum injected subcutaneously is sufficient to produce serious symptoms. The fact that this toxic action may be developed by such small quantities of serum, and the fact that exceedingly small quantities are sufficient to produce symptoms and death upon a second injection, *a priori* places both the sensitising and the toxic principle in the horse serum in the 'haptin group' of substances in the sense used by Ehrlich.

"A still further indication that the side-chain theory in its broadest sense may be applicable is the further fact that immunity may be produced against the toxic action by multiple injections of the serum.

"While at first we thought that diphtheria antitoxin had some relation to this action, we are now able to state positively that it has nothing whatever to do with the poisonous action of horse serum; further, that diphtheria antitoxin in itself is absolutely harmless. The toxic action which we have studied is caused by a principle in normal horse serum and is entirely independent of the antitoxic properties of the serum."

LONDON SCHOOL OF TROPICAL MEDICINE.

Colonel Kenneth Macleod, I.M.S., M.D., LL.D., Hon. Physician to the King, will deliver the address at the opening of the Winter Session of the London School of Tropical Medicine, on October 8th. His Grace the Duke of Marlborough, the President of the Seamen's Hospital Society, with which the School of Tropical Medicine is affiliated, will take the chair on the occasion.

His Grace has also consented to preside at the annual dinner of the staff and students on the evening of the day of the address.

21st Session—July, 1906.—*Examination Result.*

Capt. L. P. Stephen, I.M.S., M.B., Ch.B. (Aberd.), D.P.H. (Lond). With distinction.

L. A. Prins, L.M. & S. (Ceylon), L.R.C.P. & S. (Edin.), (Colonial Service). With distinction.

Capt. A. W. Cook Young, I.M.S. M.B., Ch.B., D.P.H, (Aberd.). With distinction.

Major E. Wilkinson, F.R.C.S. (Eng.), L.R.C.P., D.P.H. (Camb.). With distinction.

W. S. Allan, M.B., Ch.B. (Glas.).

R. T. Booth, M.B., B.Ch. (R.U.I.)

I. McW. Bourke, M.R.C.S., L.R.C.P. (Colonial Service).

John Cross, M.B., Ch.B. (Glas.) (Colonial Service).

B. M. Flood, L.R.C.P. & S. (Edin.) (Colonial Service).

E. N. Graham, L.R.C.P., F.R.C.S. (Edin.)

E. M. Nicholl, M.B., C.M. (Edin.)

J. Ottley, L.R.C.P. & S. (Edin.) (Staff-Surgeon R.N. retired).

E. C. Peake, M.B., Ch.B. (Edin.)

E. Robledo, M.D. (Columbia, S. America).

Miss L. G. Thacker, M.B., B.S. (Lond.)

Capt. L. L. G. Thorpe, R.A.M.C., L.S.A.

A. B. Tighe, M.B., B.Ch. (Dublin).

W. M. Wade, M.B., B.Ch. (Dublin).

Miss K. Wyss, M.D. (Zurich).

Abstract.

Human Trypanosomiasis. By Dr. Ayres Kopke, Professor at the Lisbon School of Tropical Medicine. Paper read before the Fifteenth International Medical Congress, Lisbon, April, 1906.

Professor Ayres Kopke here states the results of his researches as to the relative value of trypanosomes and of micro-organisms as causes of the symptoms and histo-pathological lesions peculiar to sleeping sickness.

He first continued the verification of the constant presence of trypanosomes in all cases of sleeping-sickness, and the identity of the trypanosomes, which cause the Gambia fever and sleeping sickness, and then endeavoured to ascertain whether the former disease was merely the first phase of the latter, and whether the appearance of the severe nervous symptoms was due only to the protozoon, or if the later infection by diplo-streptococci, aided by the first-named parasite, was really the determining cause of the final phase of the disease. Lastly, as the most important desideratum in so fatal a disease would be that of discovering a substance which would act on the *Trypanosoma gambiense* precisely as quinine acts on the malarial parasite, it was necessary to make therapeutic experiments on animals previously infected, on the lines of research adopted by Ehrlich, Shiga, Laveran and Wolferstan Thomas. The total number of cases observed by Kopke amounted to 56, of which 3 were not diagnosed as sleeping sickness. Of the 53 cases, trypanosomes were present in all of them; 40 were punctured in the lumbar region, and all showed trypanosomes in their cerebro-spinal fluid; 38 were clinically studied up to the time of death, and 36 were examined *post mortem*, and in all of these latter cases sections of the nervous centres showed leucocytic infiltrations round the vessels. Bacteriological researches were also made during life and after death; the cultivating media included bouillon and ascitic fluid, Kiefer's medium, Martin's bouillon, Martin's gelatine and simple gelatine.

During life only one case (and that only shortly before death) showed diplo-streptococci. After death, these streptococci were searched for in the sub-arachnoid exudation of the brain, the fluid in the ventricles, the heart's blood, and sometimes in the fluid obtained by lumbar puncture; they were found in 51·4 per cent. of the cases.

As regards treatment, up to the end of May, 1905, the patients were given cacodylate of soda, adrenalin, iodine and collargol, but without any favourable result. After this date, he prescribed trypanroth, alone or in combination with arsenite of soda or with atoxyl. Latterly he restricted himself to the use of the last-named method, as suggested by Thomas. Under this treatment, those patients who were not in an advanced stage of the disease showed great improvement (cessation of fever, less somnolence, increased muscular energy, more active nutrition), and the trypanosomes disappeared from the peripheral blood and from the ganglionic juice, although they were still present in the cerebro-spinal fluid.

The following are the conclusions arrived at :—

(1) In all the cases diagnosed as sleeping sickness the *T. gambiense* was invariably found.

(2) In the 40 cases on which lumbar puncture was performed, an examination of the cerebro-spinal fluid invariably revealed trypanosomes.

(3) In some cases, although the patients had trypanosomes in their cerebro-spinal fluid, marked nervous symptoms were not present.

(4) The search for diplo-streptococci during life, with one solitary exception, was negative, but after death 51 per cent. of the cases showed positive results in the blood and spinal fluid.

(5) None of the animals injected with the cerebro-spinal fluid showed the perivascular infiltrations in the nervous centres which are so constantly found in those patients who die from sleeping sickness.

(6) As regards the atoxyl treatment, a weekly hypodermic injection of 10 to 15 cc. of a 1 in 10 solution, constantly repeated for several months, showed a considerable improvement in the condition of the patients, but it is doubtful whether a cure can be obtained by this means alone. The number of trypanosomes is diminished in the blood and ganglionic juice, and the inoculation of animals may give a negative result; but trypanosomes still persist in the cerebro-spinal fluid, probably owing to the impermeability of the meninges to drugs, for which reason—

(7) Medicines—to be efficacious—should be simultaneously administered by hypodermic injection and by injection into the subarachnoid space immediately after lumbar puncture. Experiments are now being made with a 1 per cent. solution of lysol. J. E. N.

Reviews.

ILLUSTRATIONS OF BRITISH BLOOD-SUCKING FLIES, WITH NOTES. By Ernest Edward Austen, Assistant, Department of Zoology, British Museum (N.H.), 1906. Pp. 74, with 34 coloured plates. Printed by order of the Trustees of the British Museum, London, 1906. Price 25s.

This volume, which is obtainable at the British Museum (Natural History), Cromwell Road, London, S.W., and at several booksellers', is one of which the Museum authorities may be justly proud. The illustrations by Mr. A. J. Engel Terzi are excellent. It is impossible to speak too highly of Mr. Terzi's beautiful drawings. Scientifically correct in drawing, in proportion and in colour, the illustrations have been delineated with Mr. Terzi's usual care and exceptional skill, and a higher guarantee of their accuracy and completeness cannot been given. The text by Mr. E. E. Austen is written in an attractive manner and may be understood by one unskilled in the technicalities of biological nomenclature. The information collated in the volume is wonderfully wide, considering the few, the very few, people who do anything practically to advance this subject. To Lieut.-Col. J. W. Yerbury the Museum and Science generally is indebted for the devotion he has shown to advancing our knowledge of the Diptera, but we want many scores of persons imbued with Lieut.-Col. Yerbury's enthusiam before we can be said to have in any way perfected our knowledge of the subject. The volume before us should stimulate many men and women to take an intelligent interest in a subject which is aiding the medical profession to trace the origin, or at least the mode of transmission, of several of our most common ailments.

Correspondence.

THE TREATMENT OF "MALARIA ULCERS" BY LOCAL APPLICATIONS OF QUININE.

To the Editors of the JOURNAL OF TROPICAL MEDICINE.

SIRS,—Replying to the enquiry of "W. D. G." in the JOURNAL for April 2nd, 1906, as to the method of applying quinine to the so-called "Malaria Ulcers," I may say that the main object seems to be accomplished when the alkaloid (soluble or in solution) is brought into contact with the cleaned surface of the ulcer. Any soluble salt of quinine may be used, either dissolved in water and applied by means of a pledget of cotton wool, or dusted dry on the surface of the sore. The latter seems to be the most satisfactory procedure, for then the quinine dissolves slowly, and its effect is more prolonged. An important matter is to get the sore clean before applying the quinine, as the effect is otherwise *nil.* Salicylic acid is often useful in this preliminary cleaning up. Quinine should also be administered internally during the treatment of the sores.

A majority of our local "Malaria Ulcers" (which, by the way, have not been proven to hold any ætiological relation to malaria) will heal rapidly under treatment similar to that here described.

I remain, Sirs,
Yours, &c.,
CREIGHTON WELLMAN.

Benguella, W. Africa,
June 20th, 1906.

Obituary.

LIEUTENANT FORBES TULLOCH, R.A.M.C.

THE rapid termination of the trypanosomiasis infection in the lamentable case of this most promising young officer and investigator will come as an additional shock to all interested in tropical medicine. The duration of such cases is usually much more protracted, and though no cases of recovery can be recalled, it cannot be denied that recent therapeutic experiments on animals have been so promising that one felt entitled to retain some hope as long as life remained.

The case is a poignant illustration of the dangers that beset the investigation of diseases in general and of tropical diseases in particular, especially as it chances that only good fortune has saved another member of the Commission from a like fate. One of them, in fact, accidentally pricked himself with a capillary tube full of trypanosomes, but fortunately none of the latter can have entered the wound, as the entry of even a single parasite would presumably suffice to infect. While at Entebbe, Lieutenant Forbes Tulloch contributed to the *Transactions of the Royal Society* a valuable paper on "The Anatomy of Stomoxys," which would alone suffice to demonstrate his qualifications as a skilled investigator. The tragedy

of his death is, moreover, enhanced by the fact that the deceased officer married just before proceeding to Uganda, and hence leaves a young widow to mourn his loss. Lieutenant Forbes Tulloch received his medical education at St. Mary's Hospital, Paddington, and we cannot do better than close our notice by extracting from the pages of the Hospital *Gazette* the subjoined notice from the pen of a personal friend:—

"It is with deep regret that we note the sad death of Lieutenant Forbes Tulloch. He qualified in 1901 and went to South Africa as a Civil Surgeon, and in 1903 he obtained a commission in the Royal Army Medical Corps. Last year he went to Uganda as a member of the Commission for the investigation of Sleeping Sickness, and about four months ago he contracted this disease by wounding his hand with an infected knife. He was invalided home and was treated in the Queen Alexandra Military Hospital at Millbank, but the disease ran an unusually rapid course and he died on June 20th, at the early age of twenty-seven.

"We who remember him during his student days recall his good nature, his generosity and the geniality of his bearing, his character being such as made him ever one of the most popular of men amongst us. We remember, too, the enthusiastic way in which he worked at any subject, in which he was interested, such as micro-photography, to which he devoted much time and with conspicuous success.

"In a peculiarly sad and tragic way his life was cut short and his name added to the long and honourable list of those of our profession who have met their death at their noble calling. In him science loses a devoted servant, lost in her own service, and St. Mary's honours him for his life and for his death."

MAJOR H. W. ELPHICK, M.B., I.M.S.

We regret to have to record the death of Major H. W. Elphick, of the Indian Medical Service, at the comparatively early age of forty-one.

Major Elphick entered the service on September 30th, 1898, and arrived in India the following spring. From the first he withstood with difficulty the trying climate of the Plains of India, and he would have probably been better advised had he decided to abandon the attempt to cope with it.

His liking for India and his keen interest in the work, however, led to his disregarding repeated warnings, and struggling on where many men would have given in, it cannot be doubted that he has fallen a victim to the power of a will stronger than his frame.

Most of his service was passed in the Civil Department in the United Provinces, where he was well known and greatly liked, and his death will be deeply regretted by a large circle of friends.

For several years he was Civil Surgeon of Dehra Doon, the cooler climate of which, it was hoped, would enable him to continue his service. Unfortunately, this district is close to that powder magazine of Indian epidemics, the town of Hurdwar with its periodical religious fairs, so that the services of the Civil Surgeon of Dehra are often put into requisition during times of danger. During the desperate efforts of the authorities to guard Hurdwar from the spread of plague by wholesale disinfection, a riot took place in which Major Elphick was brutally assaulted. Though not absolutely dangerous, his injuries were so grave as to have a most serious effect on the health of a man never strong at the best of times, and there can be no doubt that the final break up of his health was due to the injuries he received. He had to take sick leave, and failing to recover, was placed on temporary half-pay on March 6th, 1905, and died at Rugby, on May 20th, 1906. His death will be felt as a personal loss by all his old colleagues in the United Provinces, for he was a man of charming personality, who never made an enemy.

THE REV. RODERICK JOHN JOHNSTONE MACDONALD, M.D.Edin.

The Rev. Roderick John Johnstone Macdonald, M.D.Edin., of the Wesleyan Methodist Missionary Society, was killed in China by pirates on the West River of the Kwangtung Province. The boat on which he was travelling was attacked by river pirates; the captain was shot, and Dr. Macdonald, who was a passenger by the boat, went to his assistance: whilst attending to the captain's wounds, Dr. Macdonald was himself fatally wounded.

After graduating at Edinburgh, M.B., C.M., in 1881, and M.D. in 1884, Dr. Macdonald went to China as a missionary, and was stationed at Wuchow, in the Kwangsi Province. The hospital under his charge not only increased in size by his indefatigable exertions, but through his tact, skill, and untiring devotion attained to widespread repute throughout the southern provinces of China. In addition to his hospital work, Dr. Macdonald officiated at Wuchow as medical officer to the Imperial Chinese Maritime Customs and as surgeon to the British Consulate and gaol. A medical missionary of Dr. Macdonald's stamp is a valuable national asset, and his loss under so tragic circumstances brings home to us the risks that missionaries run, not only from disease in unhealthy parts of the world, but from the turbulent spirits that are ever ready to raise their hand against them from one cause or another. The sympathy for his widow and two young sons is sincere and widespread.

Notes and News.

The Turkish Government contemplates building a hospital of 300 beds at Mecca. A dispensary already exists at Mecca, and it is intended to increase its scope of usefulness, and supply drugs gratuitously. Amongst other schemes for the benefit of the city and its pilgrims, an improved water supply is proposed.

Amongst the Turks, in both Europe and Asia, spring blood-letting is extensively practised.

C. T. GRAYSON, U.S.A., has brought out a mosquito net for use in hammocks, termed the Grayson-Graeme hammock mosquito net.

THERE are 120 male and 180 female medical missionaries in India.

THE cocaine habit is growing to an alarming extent amongst both Hindus and Mahomedans in Delhi. Amongst all classes of the community, rich and poor, men and women, adults and children, the habit is said to be prevalent.

INDIAN MEDICAL SERVICE.—The following were the successful candidates at the examination for admission to the Indian Medical Service held on July 24th, and four following days:—

J. Taylor, M.B.; A. D. Stewart, M.B.; C. H. Cross; R. A. Chambers, M.B.; R. H. Bott, F.R.C.S.; N. N. G. C. McVean, M.B.; J. Morison, M.B.; S. G. S. Haughton, M.B.; F. W. Cragg, M.B.; N. S. Simpson; S. Singh; R. F. Hebbert, M.B.; J. F. James, M.B.; J. Smalley, M.B.; A. S. Leslie, M.B.; C. M. Roberts, M.B.; A. P. G. Lorimer, M.B.; W. M. Thomson, M.B.; H. B. Scott; and F. C. Fraser, M.D.

SURGEON-GENERAL GUBBINS is gazetted P.M.O. in India, *vice* Sir Thomas Gallwey, K.C.M.G., C.B., appointed P.M.O., Aldershot.

LADY MINTO'S Fund for the Indian Nursing Association now amounts to Rs.25,000.

A TELEGRAM published elsewhere announces certain changes in the organisation of the Indian Medical Service. Since 1896 officers appointed to the Service have been allotted to the military area, though borne on one general list, and while liable in emergency to serve anywhere, are ordinarily employed in the areas to which they happen to be posted. In future the territorial allotment will be abolished, the three Presidency and General Lists of officers being amalgamated, but officials already in the Service will, as far as possible, be employed in the areas for which they are eligible under existing conditions. Future recruits to the Service will be liable to military employment in any part of India, but for civil employment they will be allowed, according to their position in the examination lists, to elect for service in certain specified areas, though in emergency they will be liable for service anywhere. —*Pioneer Mail*, July 20th, 1906.

INOCULATION IN RANGOON.—Since the issue of the circular last week by the Rangoon Municipality plague inoculation is being accepted here, over seven hundred persons having already submitted themselves to the operation.—Rangoon, July 12th.

AN account is given in the Indian *Pioneer* of what promises to be an important discovery in connection with plague prevention. This is the fact that the crude oil left after the distillation of petroleum is a most valuable insecticide. Hitherto, the rat flea, now believed to be the ordinary channel of infection with plague bacillus, has defied the usual disinfectants, but according to Dr. Turner's report to the Bombay Corporation it succumbs at once to treatment with crude oil. Should Dr. Turner's results be borne out by further trials really effective disinfection of houses where plague has occurred will become possible.

NURSING IN INDIA. — The Up-country Nursing Association is to be absorbed in the Indian Nursing Association, which is being organised to provide skilled nurses throughout Northern India by the Countess of Mayo, wife of the Viceroy. The scope of the amalgamated Association will furnish nurses for the United Provinces, the Punjab, Rajputana, the North West Frontier Province, Baluchistan, Central India, Eastern Bengal, Assam and Burma.

THE annual dinner of the Indian Medical Service was held on June 29th in the United Service Club, Surgeon-General Bomford presiding. There were also present: Colonel Bate; Lieut.-Colonels Bamber, Leslie and Dawson; Majors Macnamara, Gee, Macnab, Browning Smith, Seton, Heard, Birdwood, and Sutherland; Captains Cochrane, Ainsworth, Cornwall, Baird, Greig, Barron, Trafford, H. Ross, J. H. Murray, Harvey and MacGilchrist, and Lieutenant Proctor.

AN accusation of adulteration has been brought by the Hyderabad Government against its opium contractors, which is creating great local interest. Gum, black sand, and the husks of *sangizira* are, it is stated, used to increase the bulk and weight of the opium as retailed. The case has been adjourned to admit of expert analysis of the opium seized in Madras.

THE Chief Court of Rangoon has been transferred to another building for a week, on account of dead rats, which were found to be infected with plague, being discovered in the record rooms.

HYDROPHOBIA IN ASSAM.—Recently, there have been several cases of hydrophobia in Assam from dog and jackal bites. The Indian Tea Association of that province have accordingly asked the local Government to issue orders for the prompt destruction of mangy and ownerless dogs, and to consider whether the imposition of a dog tax would not help to rid the bazaars and bustis, which are now swarming with useless and dangerous animals. — *Pioneer Mail*, June 29th, 1906.

MALARIA.—A. Woldert, of Tyler, Texas, U.S.A., found, except in one instance, anopheles quadrimaculata in the houses in which autochthonous cases of malarial fever prevailed in Philadelphia and Texas. In cold, frosty weather the male anopheles increased in numbers, but the females gradually disappeared.

Geographical Distribution of Disease.

As information arrives we publish, under this heading, the principal diseases met with in tropical and sub-tropical countries, so that those interested in the Geographical Distribution of disease may have a means of gathering information concerning the prevalent ailments in different parts of the world.

Cholera.—The outbreak of cholera in the Philippines is subsiding. The use of the vaccine prepared at the Government laboratory is giving excellent results.

Malaria.—The U.S. cruiser *Columbia* had 165 out of 300 marines on board infected by malaria contracted at Panama when she sailed recently for Boston *via* Porto Rico.

PLAGUE.

PREVALENCE OF THE DISEASE.

		Cases.	Deaths.
India.—Week ended	May 12th	13,207	11,414
,,	,, 19th	13,061	11,783
,,	,, 26th	8,684	7,660
,,	June 2nd	7,888	7,024
,,	,, 9th	3,597	3,446
,,	,, 16th	—	1,904
,,	,, 23rd	—	952
,,	,, 30th	—	769
,,	July 7th	—	536
Hong Kong.—Week ended	June 2nd	73	72
,,	,, 9th	51	48
,,	,, 16th	57	45
,,	,, 23rd	34	31
,,	,, 30th	21	18
,,	July 7th	12	7
,,	,, 14th	14	17
,,	,, 21st	7	5
,,	,, 28th	5	6

Persia.—Plague continues in epidemic form in the Seistan District. The trade by the Nuski route with Eastern Persia is seriously threatened, owing to the prevalence of plague.

Australia.—In Brisbane up to June 16th the fresh cases of plague during the present outbreak, which commenced on March 10th, 1906, numbered 7, and the deaths from the disease 3. In Rockhampton, after an absence of six years, plague appeared on April 2nd, 1906; since then and up to July 7th, 1906, the fresh cases of the plague numbered 11.

Mauritius.—One case of plague reported during the week ended July 14th; the patient died. During the week ended July 26th 1 case of plague reported; the patient died. Since March 24th, 1906, Mauritius had been free from plague.

Personal Notes.

INDIAN MEDICAL SERVICES.

India Office: Arrivals of Indian Medical Officers in London.—Lieutenant-Colonel A. W. Alcock, C.I.E.; Major W. J. Buchanan.

Extensions of Leave.—Captain S. H. L. Abbott, Lieutenant-Colonel O. H. Channer, 6 m., Med. Cert.; Captain E. S. Parker, 6 m., Med. Cert.; Captain A. T. Pridham, 1 m., Med. Cert.; Lieutenant-Colonel J. Sykes, 8 d. furlough; Major T. W. Irvine, study leave, 1 m.; Major R. H. Castor, study leave, 6 w.; Major S. H. Henderson, study leave, 2½ m.; Major G. F. M. Ewens, from April 24th to June 30th, 1906; Captain F. A. Smith, study leave, February 15th to July 15th, 1906; Captain W. J. Wellock, study leave, March 1st to May 31st, 1906.

Permitted to Return to Duty.—Captain E. L. Perry, Captain W. Lapsley, Captain A. W. C. Young, Lieutenant-Colonel J. R. Adie, Lieutenant-Colonel J. Sykes, Lieutenant-Colonel J. J. Pratt, Colonel J. McCloghry.

Leave.

Honorary Captain M. Murphy, I.S.M., Civil Surgeon, Parlabgarh, privilege leave, 2 m.

Postings.

Captain T. G. N. Stokes, on special duty, Pachmarhi, to officiate as Civil Surgeon, Belaspur.

Captain J. G. P. Murray, to be 2nd Surgeon, Presidency General Hospital.

Lieutenant J. Catto, 16th Rajputs, to hold additional Civil Medical Charge of the Manipur State.

Colonel Wilkins, P.M.O., Burmah, is transferred in same capacity to Secunderabad.

LIST OF I.M.S. OFFICERS IN CIVIL EMPLOY AT PRESENT ON FURLOUGH.

Adie, Lieutenant-Colonel J. R., I.M.S., P. Med., 6 m., April 27th, 1906.

Alcock, Lieutenant Colonel A. W., C.I.E., I.M.S., India Misc., 12 m., August 20th, 1906.

Anderson, Captain S., I.M.S., B. Med., to September 25th, 1906.

Anderson, Lieutenant-Colonel A. V., I.M.S., Bo. Med., 26 m. 3 d., September 10th, 1904.

Baker, Lieutenant-Colonel R. J., I.M.S., Bo. Med., 6 m., August 16th, 1906.

Barry, Major T. D. C., I.M.S., Bo. Med., 21 m. 5 d., September 4th, 1906.

Braide, Major G. W. F., I.M.S., P. Goals, 4 m. 1 d., July 3rd, 1906.

Browne, Captain F. D., M.B., I.M.S., C.P. Goals, 8 m. 9 d., May 6th, 1906.

Browning, Lieutenant-Colonel W. B., I.M.S., M. Med., 4 m. 16 d., June 25th, 1906.

Castor, Major R. H., I.M.S., Burma Med., 12 m., May 9th, 1906.

Channer, Lieutenant-Colonel O. H., I.M.S., Bo. Med., 3 m. 6 w. 14 d., July 1st, 1906.

Charles, Lieutenant-Colonel R. H., I.M.S., B. Med., 11 m. 16 d.

Chaytor-White, Major J., I.M.S., U.P. Med., 3 m., June 30th, 1906.

Clarkson, Major F. C., I.M.S., B. Comm., 17 m., June 16th, 1905.

Coates, Lieutenant-Colonel W., I.M.S., P. Med., 5 m. 13 d., May 3rd, 1906.

Collie, Lieutenant-Colonel M. A. T., I.M.S., Bo. Med., 3 m. 8 d., August 31st, 1906.

Dalziel, Captain R. M., I.M.S., B. Goals, 6 m., May 12th, 1906.

Deas, Captain L. J. M., I.M.S., B. Med., 4 m.

Delany, Captain T. H., I.M.S., B. Med., 23 m. 9 d., April 9th, 1905.

Donovan, Major C., I.M.S., M. Med., 12 m., March 8th, 1906.

Drake-Brockman, Major H. E., I.M.S., B. Med., 18 m., May 5th, 1905.

Duer, Major C., I.M.S., B. Med., 18 m., May 12, 1905.

Evans, Captain S., I.M.S., Bo. Med., 11 m. 5 d., March 19th, 1906.

Fayer, Captain F. D. S., I.M.S., M. Medl., 15 m., March 3rd, 1906.
Fenton, Captain A., M.B., I.M.S., B. Goals, 15 m., August 29th, 1906.
Ffrench-Mullen, Lieutenant-Colonel J., B. Med., 21 m., August 26th, 1906.
Fullerton, Major T. W. A., I.M.S., U. P. Med., 12 m., February 18th, 1906.
Gibbons, Lieutenant-Colonel J. B., I.M.S., B. Med., 17 m. May 17th, 1906.
Gibson, Dr. F. M., Bo. Med., uncovenanted service, 21 m., August 26th, 1906.
Green, Major C. R. M., I.M.S., B. Med., 21 m., May 10th, 1906.
Grein, Major C. R. M., I.M.S., B. Med., 21 m., May 10th, 1906.
Haffkine, W. M., C.I.E.. Bo. Misc., uncov., 27 m., July 30th, 1904.
Henderson, Major S. H., I.M.S., U. P. Goals, 9 m. 14 d., January 18th, 1906.
Hugo, Captain H., I.M.S., D.S.O., B. Med., 9 m., March 6th, 1906.
Irvine, Major T. W., I.M.S., 13½ m., September 29th, 1905.
James, Captain S. P., M.B., I.M.S., 9 m., February 22nd, 1906.
Jameson, Major J. B., I.M.S., Bo. Medl., 21 m., September 15th, 1906.
Kemp, Captain D. C., I.M.S., M. Med., 12 m., September 20th, 1905.
Kenrick, Captain W. H., I.M.S., B. Medl., 10 m. 7 d., May 8th, 1906.
Kilkelly, Major P. P., I.M.S., B. Med., 10 m., May 25th, 1906.
Lamont, Major J. C., I.M.S., P. Med., 15 m. 11 d., April 1st, 1906.
Leventon, Captain A., I.M.S., B. Medl., 18 m. 2 d., June 9th, 1906.
Lincoln, Captain C. H. S., I.M.S., Bo. Med.
Lindsay, Captain V. E. H., I.M.S., B. Med., 12 m., December 30th, 1905.
Lloyd, Captain R. E., I.M.S., Indian Marine Survey.
Lumsden, Major J. S. S., M.B., F.R.C.S., I.M.S., U. P. Med., 11 m. 26 d., January 6th, 1906.
Lumsden, Major J. P., I.M.S., B. Med., 14 m. 13 d., September 10th, 1905.
Maddox, Major R. H., B. Med., 15 m. 15 d., July 1st, 1906.
Maitland, Lieutenant-Colonel I., I.M.S., M. Med., 18 m., March 30th, 1905.
Melville, Major H. B., I.M.S., U. P. Med., 20 m., March 1st, 1906.
Miller, Captain A., I.M.S., M. Med., 15 m., September 11th, 1905.
Milne, Lieutenant-Colonel A., I.M.S., Bo. Mint., 4 m., July 28th, 1906.
Monk, Lieutenant-Colonel C., I.M.S., Bo. Med.
Morwood, Major J., I.M.S., U. P. Med., 20 m. 7 d., April 7th, 1905.
Niblock, Captain W. J., I.M.S., M. Med., 12 m., March 1st, 1906.
Nott, Major A. H., I.M.S., B. Med., 14 m., August 18th, 1906.
Orr, Major W. H., I.M.S., U. P. Med., 15 m. 4 d., December 3rd, 1905.
Pank, Lieutenant-Colonel P. D., I.M.S., B. Med., 5 m. 13 d., May 25th, 1906.
Perry, Captain E. L., I.M.S., P. Med., 13 m., August 15th, 1905.
Pilgrim, Major H. W., I.M.S., B. Med., 6 m. 1 d., June 15th, 1906.
Powell, Captain A., I.M.S., Bo.
Poynder, Lieutenant-Colonel J. L., I.M.S., B. Med., 3 m. 9 d., July 18th, 1906.
Prain, Lieutenant-Colonel D., I.M.S., 19 m., February 1st, 1905.
Pratt, Lieutenant-Colonel J. J., I.M.S., U. P. Med., 3 m. 12 d., July 14th, 1906.
Rainier, Captain N. R. J., I.M.S., C. P. Med., 11 m. 23 d., November 19th, 1905.
Rait, Captain T. W. F., I.M.S., B. Med., 19 m., March 21st, 1906.
Rundle, Lieutenant-Colonel C. S., I.M.S., Burma Med., 21 m. 7 d., July 28th, 1905.
Scotland, Major D. W., I.M.S., U. P. Med., 21 m., June 26th, 1905.
Shore, Lieutenant-Colonel R., M.D., I.M.S., B. Med., 15 m., February 1st, 1906.
Smith, Captain F. A., I.M.S., B. Med., 15 m., February 15th, 1906.
Smith, Major G. McI. C., I.M.S., P. Med., 16 m., June 29th, 1906.
Smith, Major H. A., I.M.S., U. P. Med., 15 m. 4 d., July 23rd, 1905.
Smith, Major J. B., I.M.S., Bo. Med., 15 m., August 5th, 1906.
Street, Major A., I.M.S., Bo. Med., 9 m., January 15th, 1906.
Sutherland, Major W. D., I.M.S., C. P. Medl., 15 m., August 15th, 1906.
Swaine, Lieutenant-Colonel C. L., C. P. Med., 18 m. 6 d., January 17th, 1906.
Sykes, Lieutenant-Colonel J., I.M.S., U. P. Med., 3 m. 14 d., June 21st, 1906.
Symons, Captain T. H., I.M.S., M. Med., 14 m. 22 d., August 21st, 1905.
Turner, Major R. G., I.M.S., U. P. Med., 9 m., June 27th, 1906.
Wilkinson, Major E., I.M.S., P. Comm., 21 m., July 5th, 1905.
Wilson, Captain R. P., I.M.S., B. Med., 5 m. 19 d., July 2nd, 1906.
Wood, Major H. S., I.M.S., B. Med., 21 m., March 20th, 1905.
Young, Major W., I.M.S., U. P. Med., 21 m. 21 d., January 19th, 1906.

NOTICE.

HENRY D. MCCULLOCH, M.B., C.M., late Chief Medical Officer Hyderbad State Railways Hospitals, Deccan, after serving twenty-one years in India, qualified further at the Liverpool School of Tropical Medicine, and has during the last two years settled in practice at "Bassendean," Bournemouth, England.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Journ. Amer. Med. Assoc." January 2, 1906.

TAPE-WORM TREATMENT.

Ritter, John, in an article entitled "Some Parasites Infesting the Human Intestine," states that it is not necessary to fast before and after the administration of a tæniafuge for tapeworm. He advises a calomel and colocynth capsule or pill with cascara and jalap added after dinner, and on the following morning, when the bowels have been well emptied, the following emulsion:—

R.	Resinæ podophyllini	...	...	gr. i
	Oleoresini filicis maris	...	...	ʒiss
	Extracti fluidi kamalæ	...	...	ʒiii
	Spiritus chloroformi	...	...	ʒi
	Mucilago acaciæ ...	...	...	ʒi
	Aquæ menthæ piperitæ q. s. ad	...	...	ʒiii

M. Ft. emulsio. Sig.: Take in three equal doses at intervals of half an hour.

The same drugs may be given in capsules, the extract of kamala being evaporated previously to the consistence of syrup, and the oleoresin of male fern being added slightly warm.

"Therapie der Gegenwurt," Berlin, vol. xlvi., No. 12.

COOKED STARCH IN DIARRHŒA.

Hauffe, G., recommends cooked starch sipped in teaspoonfuls from time to time in diarrhœa of any kind. He finds it especially beneficial in the tubercular variety. As a gargle in sore throat it is particularly soothing.

"Hygien Rundschau," T. xvi., p. 405.

CULTURE MEDIA FOR CHOLERA VIBRIOS.

Doebert and Johannissian tested the efficiency of Hirschbruch and Schwer's medium, which is composed of gelose and Liebig's extract, to which is added some crystals of violet and heliotrope with the view of distinguishing choleraic from *B. coli* colonies; but find that the growth is greatly retarded. In both the above medium and Koch's, the colonies are fewer and smaller, and this method, therefore, fails to come up to the expectations promised for it.

"Journal of Infect. Diseases," T. iii., p. 394.

THE TRYPANSOMES OF TSETSE-FLIES.

Novy, Fred. G., endorses the views of Minchin and his colleagues to the effect that the flagellates found by Gray and Tulloch in the intestinal canal of *Glossina palpalis* have no connection with *Tryp. gambiense*. Novy had also some preparations of the intestinal contents sent him from Uganda, by Gray, and considers that the forms described by Koch as evolutionary stages of *Tryp. gambiense* and *Brucei* are entirely different from these flagellates, for the following reasons:—

(1) The Tsetse forms are much longer than the blood parasites.

(2) Their presence in flies that had no opportunity of biting infected animals, as *e.g.*, in the Tsetses of the island of Kimmi, already instanced by Minchin.

(3) The failure to obtain evolutionary forms from Trypanosomes ingested by flies fed on infected animals.

(4) The impossibility of systematically infecting animals with the flagellates of these Tsetses.

(5) The analogy of the Typanosomes of Mosquitoes.

Novy then proceeds to describe the various forms met with, the great variety of which tends to the conclusion that they belong to several distinct species. He proposes the name *Trypanosoma Grayi* for the numerous forms in one of these flies. These extremely varied forms belong to two types: one very long and thin with a long free lash, bacilliform nucleus, and large centrosome in front of the nucleus; and the other thicker and shorter, with rounded nucleus and centrosome close to it, well developed undulating membrane, and short free lash. He compares these two types with the male and female forms of Koch. It should be remembered that Minchin has seen similar forms in *C. palpalis* starting from the *T. gambiense* of the blood.

Preparations of other Tsetses yielded forms mostly differing from the above, and from each other, though evidently belonging to the same generic group, and Novy describes three more of them. Finally he states his conviction that the probably non-pathogenic flagellates found in insects correspond with the forms met with in artificial cultures.—(F. Mesnil.)

"Arch. Institut. Royal Bacter.," Camara Pestana.

Bellencourt, A., and Trança, C., describes trypanosomes from the badger and rabbit, the latter of which proved infective to other rabbits, but not to mice, rats or guinea-pigs. They also describe a bat parasite from *Vespertilio kuhli*, of Tunis.

"Lancet," March 10, 1906.

ON THE ANIMAL REACTIONS OF THE SPIROCHÆTES OF AFRICAN TICK FEVER.

Breuil and Kinghorn.—In this preliminary note the authors demonstrate the marked pathogenicity of the spirillum brought by Todd from the Congo Free State. Their investigations were started from a monkey infected by ticks, and which died with large numbers of parasites in its blood. Peritoneal injections, usually of large doses, were always adopted. Rats were usually infected in a few hours, though in exceptional cases the stage of incubation may extend to twenty-one days, and they died in from one to forty-five days. Sometimes the animal died in the first paroxysm, and in others they survived three or four days before succumbing. The principal *post mortem* signs were hypertrophy of the spleen and numerous hæmorrhagic infarcts. Mice died in from twenty-four to forty-eight hours, with enlarged spleens. Rabbits showed spirochætes in the blood after two to three hours, their number increasing and persisting for three days, the animal dying in three to ten days. The temperature ranged from 38° to 40° during the first hour, and then remained at 40·5° to 41·5° till death. Marked changes in the spleen, liver and bone marrow. Of four guinea-pigs two died on the third day, the others were infected for forty-eight hours and then recovered. A dog and a pony showed signs of infection for three days and then recovered. A monkey, subcutaneously inoculated, showed parasites in the blood. The infection of monkeys by tick bites took place after five days' incubation, and those that succumbed showed lesions of the spleen, liver and bone marrow in the shape of anæmic infarcts and necrotic areas. They conclude that the spirochæte of tick fever differs from *S. Obermeiri*.

"Att. de la Societá per gli Studi de Malaria," 1906, pp. 125-132.

THE PRESENCE OF HÆMOLYTIC BODIES IN THE BLOOD IN HUMAN MALARIA.

Dr. Dante de Blasi confirms the previous researches of Celli, Casagrandi and Carducci in their results on the non-existence of any autolytic or isolytic properties in the blood of malaria patients. His experiments were made with an aqueous extract of malarial blood. 1 cc. of blood clot is emulsified with 19 cc. of sterilised distilled water, yielding a liquid which has itself a distinct rosy tint, so that in estimating his results the experimenter must gauge the degree of hæmolysis by comparisons with type dilutions of "laked" blood. He finds that both (1) the extract of malarial blood and of non-malarial, are alike isolytic, but the former is more so than the latter. (2) The extract of malarial blood is alone autolytic. Autohæmolysis is, however, merely frequent but not constant, and may be present in all types of malarial fever. Moreover, it is not due to the taking of quinine, as one of the cases described had taken none. Further, the author found no autohæmolytic power in the blood of persons whom he had given a gramme of quinine daily for eight days hypodermically. The phenomenon, however, cannot be referable to the malarial parasite itself, as it was demonstrated in the blood of two convalescents. By centrifuging the watery extract the author separated a deposit of leucocytes and stroma of red corpuscles, that was even more hæmolytic than the liquid itself, This property of the blood-extract resists heating to 56° for half an hour, but is destroyed by 60° at the end of an hour, and by 100° in half an hour, and cannot be restored by the addition of fresh serum. The resisting power of the red corpuscles has nothing to do with malarial hæmolysis as the author, having found that a physiological solution is hæmolytic if kept for sixteen to twenty hours in contact with a well-washed clot, demonstrated that this solution was almost as effective as the red corpuscles whether malarial or non-malarial; while in using the watery extract the malarial corpuscles are much more active than the non-malarial. Intracellular hæmolysine is not specific, as he found it also in cases of typhoid, rubeola, erysipelas and scarlatina, but in a case of anchylostomiasis the watery extract was neither auto- nor iso-lytic, while the serum possessed both powers.

Lastly, the serum of malaria and of non-malaria patients inhibits the autohæmolysis produced by the watery extracts of malarial blood.

"C. R. Soc. Biologie," T. lix., p. 19.

THE PATHOGENY OF BILIOUS HÆMOGLOBINURIC FEVER, AND ITS TREATMENT BY CHLORIDE OF CALCIUM.

Vincent, H.—According to the writer this form of fever appears in malarial cases under the influence of various secondary influences, one of the commonest of which is the absorption of quinine. This drug will sometimes give rise to hæmoglobinuria even in non-malarial cases.

When due to quinine it is easy to avert the crisis by giving four to six grammes of chloride of calcium daily by the mouth, or one to two grains hypodermically, dissolved in physiological solution. The drug here acts as an anti-hæmolytic, much as it does in the coagulation of blood, or, as Delezenne has recently demonstrated, in the action of pancreatic juice. M. Laveran, however, regards the connection of quinine with blackwater fever with some reserve, as the disease is unknown in many malarious regions, and, moreover, often appears in cases that have not taken quinine.

"Semaine Médicale," April 11, 1906.

TROPICAL HYGIENE IN BRITISH, GERMAN, AND FRENCH COLONIES.

Gloaguen, surgeon in the French Navy, has published notes he made whilst cruising along the eastern coast of Africa. He was surprised to find that the British are behind the Germans in the matter of making and keeping their possessions healthy. The English fall back on their egotism and individual hygiene; the Germans on their inflexible militarism, and the French on their proverbial heedlessness.

English prophylaxis is based on two things: entire separation of the native and the European communities, and strict application of the principles of private hygiene. The English lead an active life, with athletics, &c., to keep mind and body in a healthy condition; they reside in comfortable houses, but they make no effort to render the country healthier, and improve the sanitary conditions of the natives. There is no attempt at a general plan of campaign against tropical diseases. The native quarters are left in their filth, and fall an easy prey to disease. Plague is installed in nearly all the British colonies on the Indian ocean, and with a few exceptions, no satisfactory measures have been taken even against malaria.

The Germans, on the other hand, enforce the same sanitary measures in the native as in the European quarters. Hospitals are being organised at the main points, and the country is divided into districts, each in charge of an agent empowered to enforce the sanitary regulations. Medical stations are organised along the caravan routes, and the natives are examined, registered, and given certificates. Laboratories are numerous. The streets in the native quarters have been made wide and airy, and are kept clean. The garbage is carted away daily, instead of being allowed to accumulate around the houses, as in the English and other colonies. Standing waters are drained or oiled. Quinine prophylaxis has been introduced by the Germans on an extensive scale. Wherever he went in the French colonies he constantly heard the complaint: "If only this country belonged to England, it would have been made healthy long ago." The French are now trying to introduce some semblance of the German measures into their colonies, and with some success.

"Lancet," August 4, 1906.

(1) "A Note on the Treatment of Catarrhal and Gangrenous Dysentery."

Amos, C. B. Sheldon, M.B., writing from the Hospital at El Tor, Sinai, describes his experiences during four seasons of observation. He states that (1) for slight and recent form of dysentery supervening on diarrhœa, he finds good results from sodium sulphate in drachm doses, given hourly until a fæcal stool is passed. The treatment is repeated on successive days until tenesmus is no longer complained of, and neither blood nor mucus is passed. (2) in the gangrenous form of dysentery ipecacuanha given in the usual way (30 to 60 grains ipecacuanha, half an hour after exhibiting 20 drops laudanum), is applicable and efficient in young and robust men suddenly seized with dysentery. In old and feeble patients, calomel in 4½ grains thrice daily, a treatment previously advocated, is productive of harm; calomel in minute doses of ⅛ grain, in three successive doses, is less objectionable; but calomel in any form is pernicious in dysentery. (3) Opium, by giving complete rest, is advocated by Dr. Amos in enthusiastic terms, especially in old chronic cases. Morphine, administered hypodermically, every four hours or every eight hours, as expedient, combined with sparteine or caffeine injections to combat cardiac exhaustion, is the form of administration advocated.

Rectal injections have been occasionally useful, according to Dr. Amos; sulphate of copper, 1 in 1,000, being perhaps the best, but rectal injections, when the intestine is gangrenous, are not without danger.

As regards diet, Dr. Amos states that Africans, Turks, and all Asiatics almost invariably evince a great repugnance to milk. When they can be persuaded to take it the *régime* followed is as follows: They receive half a pint of milk at 7 a.m., when those without hæmorrhage also have a small piece of bread; at 11 a.m. a plate of finely mashed rice, potatoes, lentils, macaroni, or beans, over which a little meat soup has been poured, is served round. Convalescents also have a small piece of bread. At 5.30 p.m. they have a similar meal. During the night they have a pint of milk diluted with water to the patient's liking. Those who are very weak have in addition each day the whites of four eggs beaten up with brandy or water. The yelks of eggs they cannot digest. No pure water is given, but a 1 in 3000 solution of lactic acid is placed at the bedside for them to sip at will. With this dietary blackened tongues become moist and clean in one or two days, thirst disappears, no undigested food appears in the stools, and no difficulty is found in inducing the patients to take nourishment.

(2) "A New Subspecies of *Glossina palpalis* on the Upper Congo."

Massey, A. Yale, writing from Ruwe, Congo Free State, states that at the junction of the Lufupa and the Lualaba, 10° S. lat., specimens of the subspecies *Glossina palpalis wellmani* have been found. Isolated cases of sleeping sickness have been found in the locality, but it is unknown where the patients contracted the disease.

(3) "A Case of Plague with Unusual Eye Symptoms."

Rees, Phillip, M.B.Lond., at the Fatshan Hospital, near Canton, China, has recently observed some unusual signs and symptoms of plague. In one case the submaxillary region was swollen and infiltrated to an inordinate extent; in other cases no glandular enlargement could be detected; a blood-stained discharge from the nose is recorded in one or two fatal cases. A female patient, with enlarged glands in arm and groin, and in whom abortion occurred on the sixth day of the illness, developed conjunctival hyperæmia, the pupil of the left eye became occluded with lymph, and there was slight hypopyon. In the right eye there were three patches of lymph on the posterior surface of the cornea. Atropine instillation gradually dilated the pupil, the woman, however, refused further treatment, and died whilst under the care of a native doctor.

Notices to Correspondents.

1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the JOURNAL OF TROPICAL MEDICINE should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communications.

THE BACILLUS OF HAMILTON WRIGHT, OBTAINED FROM TWO CASES OF ACUTE BERI-BERI.

By LEONARD S. DUDGEON, M.R.C.P.Lond.

Bacteriologist to St. Thomas's Hospital; Lecturer on Pathology in the Medical School, and Director of the Hospital Laboratories.

(From the Pathological Department, St. Thomas's Hospital).

A SHORT account will be given here of the bacillus which Dr. Hamilton Wright isolated from the duodenum and from the fæces in two acute cases of beri-beri, and which he sent to me for investigation. It will be most convenient to refer firstly to the morphological and cultural characters of the above mentioned organism, and then to refer to the experiments which were made as to the pathogenicity of this bacillus.

MORPHOLOGICAL CHARACTERS OF THE BACILLUS ISOLATED FROM THE DUODENUM.

This organism varied from 0·5 to 5 μ in length, some very long forms occurring in chains were also met with; no constant or typical arrangement was observed. It was Gram positive and stained well with basic Fuchsin and Loeffler's methylene blue. The organism did not take the stain with the same intensity throughout, some portions being much paler than others.

MORPHOLOGICAL CHARACTERS OF THE BACILLUS ISOLATED FROM THE FÆCES.

This bacillus showed no tendency to form chains, was a stouter bacillus, often found in clumps, the staining was more irregular, with a tendency to darkening at the poles, while a few of the bacilli showed definite club-shaped ends; in other respects this bacillus resembled that isolated from the duodenum.

CULTURAL CHARACTERS.

It may be stated at the outset that the organism which Dr. Hamilton Wright has isolated from these cases of beri-beri, was an obligatory anærobe. It was found to be a matter of considerable difficulty to cultivate this organism in liquid media, even under anærobic conditions. Most satisfactory results were obtained by growing it in the depths of solid media.

It will be most convenient if the cultural characters of the bacillus isolated from the duodenum and from the fæces are given in a tabulated form under the respective headings. The points of resemblance will then be very readily seen. In all instances, except shake cultures, the organism was grown at 37° C., either in Buchner's tubes or Bulloch's anærobic jars.

DUODENUM.	FÆCES.
Agar slopes. — Delicate and slightly opaque colonies appeared in twenty-four hours; they only slightly increased in size as time advanced. The full sized colonies were about the same diameter as those of a virulent streptococcus.	Ditto
Litmus milk. —No change in fourteen days.	Ditto
Glucose gelatine shake. —(22 C.). Small opaque white colonies occurred in the depth of the medium in twenty-four hours; as time advanced, the colonies slightly increased in size, were opaque and showed no tendency to produce liquefaction of the medium, even at the end of several weeks. The growth was very much more abundant in the depth of the medium than at the surface. In many instances a typical stalactite arrangement was noticed. No gas formation occurred.	Ditto
Glucose gelatine stabs.—(22° C.). A delicate growth occurred along the course of the needle and gradually became more marked as time advanced. At the end of a month the colonies were thick, opaque, white and much larger sized towards the depth of the jelly than towards the surface.	Ditto
Glucose agar slabs.—(37° C.). Similar results to the glucose gelatine slabs.	Ditto
Neutral red broth.—No alteration in colour at the end of one month's incubation.	Ditto
Drigalski and Conradi's medium.—Stab cultivations were made, but no alteration in the colour of the medium occurred after one month's incubation at 37° C., and no definite colonies were detected.	Ditto
Litmus maltose shake.—Acid, but no gas at the end of seven days' incubation.	Acid, but no gas at the end of seven days' incubation.
Litmus lactose shake.—Acid, but no gas at the end of seven days' incubation.	No change.
Litmus raffinose shake.—No change.	No change.
Litmus mannite shake.—No change.	No change.
Litmus cane sugar.—Acid, but no gas in seven days' incubation.	Ditto

PATHOGENICITY.

Saline emulsions were made from a forty-eight hours' culture on agar of the bacillus from the duodenum and also from the fæces.

Experiment A.—Two cc. of each culture were injected into the peritoneal cavity of two guinea-pigs, but neither animal was in the least way affected, and when killed at the expiration of one month, appeared to be perfectly healthy. The heart muscle was stained with Scharlach R, but failed to show the slightest evidence of any fatty change.

Experiments B and C.—Two cc. of saline emulsions from gelatine cultures were injected into the peritoneal cavity of mice and subcutaneously into guinea-pigs, but in no instance was any effect produced.

Experiment D.—A guinea-pig was fed on 2 cc. of a saline emulsion of the bacillus isolated from the duodenum, but at the end of one month the animal was apparently well.

AGGLUTINATION TESTS.

Owing to the courtesy of Dr. Stanton, of the

Seamen's Hospital, I obtained the blood from three cases of beri-beri. A forty-eight hours' culture of the bacillus isolated from the duodenum was used for the agglutination reactions.

	Period of Disease	Result
Native of Bombay	Early stage ..	Dilation 1·20, no reaction
Norwegian sailor...	6th month ..	,, ,,
Native of Calcutta	Six weeks. (Several cardiac attacks during the past few weeks.)	,, ,,

Conclusions.

(1) From the investigations which I have made it seems probable that the bacillus isolated from the duodenum and that isolated from the fæces are one and the same organism. The only points of difference are slight variations in their morphology, and that one of them acidifies lactose, the other not.

(2) There was nothing in this investigation to show that the organism of Hamilton Wright is related to beri-beri. It has been found to be non-pathogenic to mice and guinea-pigs, and the serum obtained from three cases of beri-beri during various stages of disease, failed to produce any agglutinative reaction on this bacillus.

Of course, one must be fully alive to the fact that, although this bacillus is non-pathogenic to mice and guinea-pigs, and did not agglutinate when tested with the serum of three cases of beri-beri, it may, yet, be the cause of the disease, but this seems to me improbable.

BERI-BERI; MOULDY RICE: THE OCCURRENCE OF BERI-BERI IN THE SOKOR DISTRICT.

By John D. Gimlette, M.R.C.S.Eng., L.R.C.P.Lond.

The inference that beri-beri, as it occurs in British Malaya, is due to mouldy rice was taken some years ago as the basis of an argument by Mr. Leonard Braddon, F.R.C.S., State Surgeon of Negri Sembilan, in the Federated Malay States [1]. It excited a good deal of local discussion at the time, and the mouldy rice theory was again lately revived by Dr. S. Lucy, Colonial Surgeon, Penang [2], and still more recently urged by Charles Hose, Esq., D.Sc., Divisional Resident of Sarawak, in North Borneo [3].

It is a theory, and there are many who are not satisfied with the circumstantial evidence which has been brought forward to support it, while there are others, notably, Dr. E. A. O. Travers, State Surgeon of Selangor, who have decidedly disagreed with Mr. Braddon's original contention that the probable cause of beri-beri is a toxin conveyed in certain forms of rice [4].[1]

[1] Many others who have spent years in exhaustive research work on Beri-beri have entirely rejected the rice theory. The cause of beri-beri, however, has not yet been definitely proved by them to Science, and for this reason I think that any new evidence which appears to support the rice theory is worthy of their attention.

The following notes were taken in the interior of Kelantan, a distant State in the Malay Peninsula, about 350 miles north of Singapore. Three years ago mining operations were commenced in Kelantan by a British Syndicate which was soon formed into a large Company, to which I was appointed the first resident medical adviser. The native state of Kelantan had not hitherto been explored by any European miners. It was therefore a typically new country, with new mines, and, beri-beri being such a well-known local scourge among Chinese, some anxiety was felt in the early days of the Company as to the health of the newly imported gangs of coolies that were necessary to carry on the work of underground mining.

Chinese labour is universally employed for this purpose in the Malay Peninsula, but, curiously enough, this mining district in Kelantan (afterwards referred to as the Sokor district), remained at first remarkably free from beri-beri. No cases were diagnosed in 1903.

Mining operations were commenced in the interior of Kelantan, in a valley some seven miles distant from a small station on the river Sokor; the general welfare of the Company's coolies was quite as well, if not better, cared for as compared to that in similar mining districts; the meteorological conditions—all very favourable to the formation of moulds—were found to be more or less the same as those in other parts of the Malay Peninsula; the coolies were fed upon imported Rangoon rice, as is customary in other mining camps in this part of the world.

Rangoon rice is more liable to be attacked by moulds and weevils than any other kinds of imported rice [3]; it is also more difficult to clean for cooking, as it soon becomes broken in the necessary process of kneading and washing, but it is cheap and is in common use. The supply was mainly obtained by the Company from Singapore, because the conservative Chinese do not care to purchase rice which is grown locally and only roughly husked by indolent Malays for retail; moreover, the Company had endeavoured to store Kelantan rice, but found that this was impracticable, as it very quickly deteriorated after it had been husked by hand and stored.

As there was no market in the Sokor district it was necessary to stock a comparatively large amount of rice for the Chinese miners; this was all kept, at first, in a small store at the river station in bags, each of which generally contained from 1 to 1½ pikuls of rice. The pikul is a Malay measure of weight in everyday use; it is approximately equal to 133¼ lbs. avoirdupois, and is divided into 100 catties, each catty roughly corresponding to 1⅓ lbs. avoirdupois.

Why Rice Deteriorates.

These large bags were all piled in a small space, one on top of another to a height, and being fairly heavy were difficult to interchange. When a large supply of rice came in, the new bags were invariably placed on the top of the old pile. This was unfortunate, as was afterwards proved, because, long before the delivery of the rice on the bank of the river Sokor it was exposed, as rice in the husk, to deterioration through damp. The writer of an article on "A Trip to Burma," recently published in the local press, says, when describing the railway journey from Ran-

goon to Mandalay: "A resident of the country told us that the paddy owners often had to wait a month before the railway could take their grain. We saw stacks and stacks of it—in bags—lying out in the open alongside the line near railway stations" [5]. The rice is shipped from Rangoon to Penang, and from there to Singapore.

Dr. Lucy also mentions that when large consignments of this rice to the Straits Settlements coincide with an interval between the crops in Rangoon, the only supply at these times is of an inferior quality left over from the last crop. Such an interval occurs in October. As regards Kelantan, delays occur in shipping from Singapore, as well as delays and boating accidents on the Kelantan rivers, especially during the violent weather of the North East monsoon season, which is mostly felt during the months of November, December and January.

Local means of communication with the Sokor district, again, are very slow; under ordinary circumstances six or seven days are taken in transporting cargo by river boats to the headquarters of the Company, located about fifty miles inland from the coast; from there it has to be transhipped into much smaller boats for transport up the river Sokor, which is a small stream in the adjoining Sokor district. Another four days would be taken before it was finally distributed in the mining camp, making a fortnight from Singapore even in good weather.

Some idea of the bad weather during the North East monsoon season may be gathered from the records of rainfall in Kelantan. The rainfall in the Sokor district was 27·99 inches in December, 1904; 17·42 inches for the month of November, 1905; 10·97 inches in December, 1905, and 28·48 inches for January, 1906.

Mining coolies or their contractors obtained rice, from time to time, in small quantities by means of an order in writing on the clerk in charge of the river store and carried it through the jungle to the mine. There was a tendency on the part of the contractors to apply for large quantities of rice at the beginning of the month, but it could not always be delivered to them then, on account of occasional difficulties with the jungle transport. Their applications varied according to circumstances, and their only means of supply was through the river store. The main rivers in Kelantan may rise to a height above 30 feet during the wet weather, and there are then corresponding floods in the smaller streams, such as the Sokor river and other small rivers in the district. Good judgment was therefore essential in order to keep a fair balance between the supply and demand for rice at the river store. The native clerk in charge of the store was an intelligent Sumatran who was appointed in 1903.

Prevalence of Beri-beri.

Little concern was felt as regards beri-beri during the greater part of 1904, although the number of Chinese workmen was greatly increased. There were, for instance, only eight cases of this disease registered, with two deaths, a mortality which was trifling when compared to an appalling death-rate of 79·99 per cent. (187 deaths out of 234 cases), as I had known it in one of the mining districts of a neighbouring State [6].

Towards the close of the year, however, the general health of the Sokor district was far from satisfactory, malaria was very prevalent in the mining camp, which had always been topographically unfavourable to health. Special attention was accordingly paid to sanitation, and some expense as well as much trouble was incurred in trying to render the camp more healthy, but it was, nevertheless, unsatisfactory to report, at the end of June, 1905, that a number of cases of beri-beri had occurred. There had been 37 cases with 7 deaths.

The coolie gangs had been increased by about 100 men as compared to 1904, bringing the whole strength up to 400 Chinese. Among them were a number of inexperienced new comers from Singapore, who had been engaged by a Chinese contractor in May under conditions similar to those of the "Singkheh" or indentured Chinese labourer of the Straits Settlements.

The bad health of the "one year contract Singkheh" is notorious in the Malay Native States, and these new arrivals in Kelantan suffered, as might have been expected, considerably more than older "Lowkhehs" or time expired Singkhehs would have done. Twelve of them died from various causes in a very short time, six of them from beri-beri in July.

Many of these untrained Chinese were lodged in some newly-erected coolie lines, and it was thought at the time that they were being affected by reason of a somewhat extensive disturbance of the soil which was found necessary when erecting their buildings. As beri-beri has been thought by some to have an indefinite connection with disturbance of the soil in the Tropics [7], stress was laid on this fact; greater attention was paid to sanitation; old buildings were destroyed; the ventilation and hygiene of the camp generally improved, and overcrowding prevented as far as possible.

Table A.

Showing the Incidence of the Disease in 1905.

Months	New Cases	Deaths	Nationality			Treated in Hospital	Treated as Out-patients
			Chinese	Javanese	Malays		
January ..	6	5	2	4	..	5	1
February ..	..	1	..	..	..	..	..
March ..	2	..	2	..	..	..	2
April	1	..	1	..	..	..	1
May	10	1	9	1	..	4	6
June	18	..	17	1	..	7	11
July	28	6	28	..	..	8	20
August ..	10	1	10	..	..	..	10
September ..	4	..	4	..	..	..	4
October ..	5	..	5	..	..	..	5
November ..	9	2	9	..	..	1	8
December ..	12	1	7	..	5	1	11
Total ..	105	17	94	6	5	26	79

The principles of sanitation in the Tropics were now very strictly enforced, and at the end of the year a great diminution in the prevalence of malaria was the result, but it was vexatious to find that there had been 68 additional cases of beri-beri with ten more deaths from this disease. The incidence of the outbreak is shown in the attached table A.

With regard to this table it is important to note that the total strength of the mining coolies was reduced by more than one half during the last five months of the year. The reduction began in August, and by the end of the year there were only about 100 Chinese miners left at the works. Under the heading "new cases" only different individuals are included; the death which occurred in February was a case which had remained over from January. It is only of passing interest to notice that, as regards seasonal prevalence, by far the greater number of cases occurred during the months of the south-west monsoon, namely, from April to September inclusive. The greater number of coolies were employed during these months. The influence of the north-east monsoon on the supply of rice will be seen later.

TABLE B.

SHOWING THE CLINICAL FEATURES OF THE FATAL CASES IN 1905.

Date, 1905	Nationality	Subjective Symptoms	Died, 1905
Jan. 1	Javanese ..	Slight previous fever, weakness, orthopnœa, sudden cardiac pain and vomiting	Jan. 14
,, 1	Javanese ..	Admitted for ulcer of leg, swelling of legs and body followed, died suddenly	Feb. 20
,, 13	Ch. Kheh..	Debility, shortness of breath, swelling of legs and face	Jan. 14
,, 14	Ch. Kheh..	Sudden severe cardiac with hepatic pain and orthopnœa	,, 14
,, 18	Javanese ..	Previous fever, weakness, swelling of whole body and extremities, sudden cardiac pain	,, 29
,, 31	Javanese ..	Anæmia, debility, dyspnœa, tenderness of legs, with sudden cardiac and hepatic pain	,, 31
June 28	Ch. Kheh..	Previous fever, numbness and tenderness of legs, with general œdema	July 8
July 1	Ch. Hailam	The same as above	,, 7
,, 2	Ch. Hailam	The same as above	,, 15
,, 5	Ch. Kheh..	The same as above, with hepatic pain	,, 9
,, 10	Ch. Hailam	The same as above	Aug. 14
,, 24	Ch. Kheh..	Second attack, great cardiac pain and dyspnœa, died suddenly	July 24
Nov. 2	Ch. Kheh..	Previous fever, swelling of whole body and dyspnœa	Nov. 9
,, 24	Ch. Hailam	The same as above, with greater swelling	,, 24

The date in the table above refers to the day on which the patient first applied for relief.

The incidence of the outbreak was characterised as follows: in January it occurred in the acutest form of the disease, all the cases died. In the second week there were three sudden deaths within twenty-four hours. The outbreak was mainly confined to the Javanese who were employed as timber cutters, 33 in number, and was so unexpected as to arouse the private suspicion that the patients had been poisoned by their contractor for the purpose of gain. The cause of their deaths, however, was investigated, and all the cases were registered as due to acute beri-beri.

In May an equal number of cases occurred in each half of the month; the same happened in June, but in July, when the disease was at its height, 18 cases out of the total occurred in the first half of the month. The total Chinese strength was then also at its maximum. In August, 8 cases occurred in the first half of the month, and in November again 5 in the first half of the month. In December, it attacked the Malays for the first time and was seriously affecting the Chinese; of the total number treated 9 applied again for relief during the first half of the month. The death rate for beri-beri in 1905 was 16·19 per cent. for cases treated, the greatest mortality occurring in January, July and November. In every instance the disease was of the so-called wet variety; the chief clinical features of the cases which were fatal during January, July and November are shown in table B.

ASSIGNED CAUSES OF BERI-BERI.

It was part of my duty to visit the Sokor district twice every quarter, and to leave a written report before returning to headquarters. The importance of improved sanitation as a check to beri-beri was frequently referred to in my reports, but the possibility of mouldy rice being a vital factor in connection with the disease was, unfortunately, overlooked until the last month of the year. In the second week of March, however, I examined the diets of the Javanese and reported that their rice was of good quality, but not sufficiently cooked. The Chinese themselves in the Sokor district do not regard mouldy rice as even a probable cause of beri-beri; on being questioned as to the cause they almost invariably refer to exposure to the very cold water in the underground workings or to the drinking of bad water.

The Sokor district hospital is in charge of a Chinese dresser (corresponding in rank to the Indian hospital assistant); this dresser was specially chosen in 1904, partly on account of his experience of beri-beri. He had formerly been in the F.M.S. Government Service under me, and was, at that time, stationed in the mining district, where the death rate from beri-beri was as high as 79·99 per cent. of cases treated.

Late in December he called my attention to the diet which was then in everyday use in the camp, and collected, on December 20th, samples of the rice which was being prepared for the meals in the coolie lines on that day. I examined and found that these samples were full of the live larvæ of a small light brown moth and that the grains of rice were clotted with excrementitious matter. The worst sample was one taken at the coolie lines occupied by some Chinese miners under contract to a Hailam named Ah Juan. This contained, in addition, a few small beetles, as well as the well-known rice weevil, *Calandra oryzæ*, *L.*

At the coolie lines the Chinese cooks were trying to clean this rice by hand after drying it in the sun, and

then washing by kneading it, by means of their feet, in perforated empty kerosine tins. As soon as it was sufficiently clean to the naked eye it was cooked in the usual way, that is to say, it was put into a large iron cooking pan (a kwalli), containing boiling water, stirred and boiled until it was cooked and then finally allowed to steam under the cover for about half an hour, when it was ready to be eaten either hot or cold. Water for washing and cooking was obtained from a small stream running through the camp.

Three of the Chinese cooks employed contracted beri-beri, one in the month of May, one in August, and another in October, each after about two months' work in the coolie lines. These cooks were, as is characteristic of their race, mixing good rice with the bad in order to deceive the coolies. They cooked rice twice a day in accordance with the usual Chinese custom; it was their staple diet, meat being seldom eaten.

It is important to note here, that all the rice at the river store had, at the close of the year, been transferred to a new store house which had lately been built at the mine. The river store house, only 13 feet by 18 feet and about 10 feet in height, had become too small. The rice was transferred from there during the months of September, October, November and early in December, the fresh supply of rice for December being carried direct to the mine. As soon as the bad rice was discovered in December, an examination of all the rice in the new store was held, and it was reported that a large quantity of it was unfit for consumption. I saw that most of it was infested by the same kind of worms and insects mentioned above, but by careful winnowing more than half of it could be rendered, to all intents and purposes, similar in appearance to good rice. There were several bags also in which the rice was greenish, sour-smelling and distinctly mouldy; the sacking was caked inside with rice which had obviously decayed owing to exposure of the bags to water.

Deteriorated Rice an Apparent Factor in the Etiology of Beri-beri.

It is now of interest to try and trace the connection, if any, between the occurrence of beri-beri in the Sokor district and the variation in quantity of fresh rice supplied from the local store, and I think it will be admitted that this particular outbreak appears to have been coincident with the use of deteriorated rice.

In the year 1904, all the eight cases of beri-beri occurred in the first two months of the year, one in January and the other seven in February; they were all Chinese, the one in January died suddenly and another almost suddenly in February. At this time the coolies, who were for the most part newly arrived Hailam miners, were working on the top of a high hill, which caused their local means of communication to be even a little more difficult than was usual. Five of the 8 cases occurred among the Hailam miners; they had all eaten deteriorated rice.

At the end of 1903, there were 119.24 pikuls of rice in the river store, much of which must have been at the bottom of the pile for some time, no fresh rice was received in January, 1904, but 60.58 pikuls were issued, leaving 58.66 of the original balance from 1903; in February, only 27 pikuls were received, and by the end of the month 73.96 pikuls had been issued. The greater part of the old rice was therefore used up in the month of February. The balance in hand at the end of the year 1904 was 104.06 pikuls of rice. With the exception of the month of February, when the amount of rice in store at the end of the month was only 12.40 pikuls, the balance of rice at the end of each month varied between about 30 and 90 pikuls throughout the year, but the amount was slightly greater during the last two months, when provision was being made for the north-east monsoon season. There was never a great surplus of rice in stock in 1904.

The Sumatran clerk in charge of the store told me that he always, so far as possible, endeavoured to interchange the bags, and this would have been feasible provided the supply of fresh rice was moderate in amount.

It was impossible to attempt to trace the local issues of the bags originally imported from Singapore, because the larger bags containing 1½ pikuls of rice were made up into smaller ones at the river store in order to facilitate their transport through the jungle to the mine; the small bags had no distinguishing marks, but through the courtesy of the General Manager of the Company I am able to show the exact amount of fresh rice that was stored during the year 1905.

The accuracy of the data given in the attached tables C and E can, I know, be relied upon, they have been prepared for me by the Chief Accountant of the Company. The figures, although complicated, are worthy of close attention.

In connection with table C, it is very important to remember that there can be no doubt that the tendency was to pile the bags of fresh rice on top of the older ones, and that until the rice began to be transferred from the river store many of the oldest bags were necessarily at the bottom of the stacks.

Table C.

Showing the Variation in Quantity of Fresh Rice in use in 1905.

Months	Amount of fresh rice stored during the first half of the month	Total amount of rice issued during the first half of the month	Amount of fresh rice stored during the second half of the month	Total amount of rice issued during the second half of the month
	Pikuls	Pikuls	Pikuls	Pikuls
January	16.93½	93.00	92.09	23.45
February	79.86	46.95	86.04	18.35
March ..	16.01	57.30	54.23	24.07
April ..	120.36	40.67	23.96½	76.20
May ..	6.82	82.58		40.82
June ..	81.79	84.93	87.83	27.12
July ..	136.95	75.44	100.74	27.30
August ..	111.60½	64.90	25.27½	30.32
September	86.06½	95.45	163.81½	20.70
October ..	84.76½	67.11	39.24	51.00
November	24.30	62.97	54.13½	24.50
December	23.88	41.70	—	25.10
Total ..	789.34	813.00	727.36	388.93

An examination of the above table shows that a very large quantity of fresh rice was stored throughout

the year but the store was very short of fresh rice in the first half of January. The 16.93½ pikuls was delivered in two consignments, one of which (5.96½ pikuls) was received as late as the 7th of the month and the other (10.97 pikuls) not until the 9th of January. It follows therefore that 76.03½ pikuls of the old rice left from 1904 were used, and that 27.99½ pikuls of it remained in the store.

Very little fresh rice was received in May (only 6.82 on the 4th of the month), but the maximum 249.88 pikuls was received in September, as well as large amounts (165.90 pikuls) in February, and 237.69 in July, but only 78.43½ in November, the greater part of which came in on the 20th of that month.

A more critical examination of table C. shows that 96.63½ pikuls of rice were in stock at the end of January, and it will be remembered that of this amount 27.99½ pikuls remained from the old stock of 1904; by deduction it will be found that, disregarding this amount of 27.99½ pikuls for the present, the remaining 68.64 pikuls may have remained untouched until the first half of June, when 3.14 pikuls of this old rice must have been issued. At the end of May, exclusive of the 68.64 pikuls, there would have been only 28½ catties of fresh rice in hand. In the first week of June the greater part of the fresh rice (48.86 pikuls) was not received until the 13th day of the month and by far the greater quantity of rice was issued in the first half of this month as compared to the second half, and again, as regards the supply of the second half, 47.35 pikuls were received as early as the 18th of June. The labour force, it will be remembered, was greatly increased in May by a number of unacclimatised coolies.

It is not possible to supply an accurate statement of the days on which the rice was actually received by the Chinese contractors and other natives, through reason of the carelessness with which they presented their orders for rice at the store, but it may safely be presumed that the 68.64 pikuls with the old stock (27.99½ pikuls), was in use about this time and that the oldest of it had greatly deteriorated. This is corroborated by the Sumatran clerk, who tells me that he went on leave in February and found on his return in May that his substitute had neglected to endeavour to interchange the bags.

At the end of June, 126.55½ pikuls were in stock, including probably much of the 27.99½ pikuls left over from 1904, and on referring again to the bills of lading of the boat service, I found that the greater part (97.70 pikuls), of the fresh rice for the first half of July did not arrive until the 8th day of this month, while the greater part of that received in the second half (71.07 pikuls), came in as early as the 17th of July.

The Mining Accountant at the Sokor camp has kindly given me a note of his weekly balances of the rice in stock at the river store from May, 1905, until December; they were lowest on June 17th (90.68 pikuls), on June 9th (90.98 pikuls), on May 27th (94.61½ pikuls), on May 30th (126.96 pikuls), on June 24th (125.31 pikuls), and on July 1st, when there were 140.61 pikuls.

There can be no doubt, I think, in concluding that either stale or greatly deteriorated rice was in use at the end of December, 1904, during the first half of January, 1905, in May, at the beginning and end of June, at the beginning of July and probably at the end of July; it was found in use in December, 1905, after the rice had been transferred from the river store to the new store-house.

A brief summary of the clinical history of the disease shows that beri-beri occurred markedly in the beginning of January, 1905, in May, in June, very markedly in the beginning of July, and in the beginning of August, and as the rice was transferred in September by means of a limited number of bullock carts, in the process of removal it may, I think, be reasonably supposed that the oldest bags of rice then came into circulation, but this may have been delayed owing to the very large supply of fresh rice which was received in September, on account of the coming of the north-east monsoon season.

In September and October the advance of the disease was arrested, but only to again progress in November and December.

The labourers in the Sokor district comprise chiefly Chinese, and for surface work a few Javanese and some Kelantan Malays. The Chinese are divided into two classes, the Hailams, who are immigrants from Hainam, and the Khehs, who come from a district north of Canton. Both classes form the mining coolies and each work in separate gangs under a contractor or contractors of their own class. Besides Chinese miners there are a few fitters and other Chinese who are not working under contract. The proportion of cases and deaths from beri-beri among the Chinese is shown below in table D.

TABLE D.

SHOWING THE PROPORTION OF CASES AND DEATHS AMONG THE CHINESE IN 1905.

Months	Hailams under Contract		Khehs under Contract		Other Chinese		Treated in Hospital		Treated as Out-Patients	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
January ..	—	—	2	2	—	—	1	1	1	1
February ..	—	—	—	—	—	—	—	—	—	—
March	—	—	—	—	2	—	—	—	2	—
April	1	—	—	—	—	—	—	—	1	—
May	4	—	2	1	3	—	5	1	4	—
June	11	—	6	—	—	—	10	—	7	—
July	18	2	9	3	1	1	8	5	20	1
August ..	2	—	6	1	2	—	—	—	10	1
September ..	1	—	2	—	1	—	—	—	4	—
October ..	—	—	5	—	—	—	—	—	5	—
November ..	5	1	4	1	—	—	8	1	1	1
December ..	6	1	1	—	—	—	6	1	1	—
Total ..	48	4	37	8	9	1	38	9	56	4

It will be seen that the Hailams suffered most in July—18 cases with 2 deaths, also the Khehs in July —9 cases with 3 deaths, and that the only death which occurred among the other Chinese was in July. On turning to the hospital registers it was found that out of the 18 cases reported during the first half of July, no less than 13 occurred during the first week,

and that all the deaths, as shown in table B happened, with the exception of one, to be in the first half of the month. All the cases mentioned in this paper were of the male sex; there were only three Chinese and very few Malay women in the camp.

Reverting to the supply of rice from the store it may be seen that the Hailams and the Khehs, as well as the other natives, obtained very large supplies of rice during the months of May, June and July, but comparatively little in February. The amount purchased by them and other natives is shown in table E.

TABLE E.

SHOWING THE AMOUNT OF RICE PURCHASED BY CHINESE AND OTHERS IN 1905.

Months	Hailam Contractor	Kheh Contractor	Other Chinese	Javanese	Malays
	pikuls	pikuls	pikuls	pikuls	pikuls
January	44.49	15.00	5.50	7.40	15.39
February ..	35.00	16.00	2.90	4.60	9.40
March	37.00	27.00	4.00	3.00	8.87
April	46.00	26.00	3.65	6.00	5.47
May	47.00	40.50	6.90	4.00	5.80
June	37.12	41.00	7.10	7.00	6.02
July	38.00	39.50	2.70	—	3.20
August	23.00	43.00	3.90	—	5.50
September ..	23.00	38.00	3.95	5.00	8.85
October	26.00	38.00	2.30	3.00	22.85
November ..	21.00	28.00	1.70	—	17.36
December ..	16.00	24.00	1.50	4.50	9.00
Total ..	393.61	376.00	46.10	44.50	117.71

BERI-BERI AS IT AFFECTS MALAYS.

It is now of telling interest to refer to the outbreak of beri-beri among the Malays and Javanese in the Sokor district. Malays, speaking generally, have no tendency to beri-beri, and they do not, as a rule, eat imported rice, but prefer to eat that which they plant and grow in their own country.

This rice is very seldom stored by them in their houses, unless in the form of paddy or rice in the husk; we have seen that this is very liable to go mouldy if stored. The natural custom of the Malays is to pound small quantities of their paddy into rice for cooking, and use it fresh, from day to day, as may be required for their household use. This exertion is undertaken by the women folk, who do not, as a rule, follow their people to the mining camps. One of the Malay patients in the Sokor district told me that although the Rangoon rice was very convenient, he could not afford to buy it all the year round as it was so much more expensive than the Kelantan rice, and he remarked naïvely that it always smelt of the bag even after it had been well washed and cooked.

The Malays in the Sokor district have always been in the habit of buying most of their rice at a village called Kusial, some fifteen miles distant, but, during the north-east monsoon season, owing to the wild weather and to the greater difficulty of jungle transport, they always buy Rangoon rice from the company's store in comparatively large amounts, as may be seen in Table E. It is significant that these Kelantan coolies, among whom beri-beri is unusual, should have escaped in June and July but should have succumbed in December, when they were eating the bad rice.

The weather in January, 1905, was remarkably mild for the north-east monsoon period, the total rainfall for this month only being 5·22 inches, and, under these circumstances, Malays could have obtained Kelantan rice from the village of Kusial. Malays in the Sokor district are too independent by nature to associate intimately with the Chinese, but will fraternise and eat rice with the Javanese. It will be noticed that the latter also laid in a comparatively large supply in January, February, and December, and probably for the same reason, but their mode of buying it from the store was quite different. The Malays invariably buy rice from the store in small quantities of about 40 to 80 catties at a time. The Javanese, who cannot so well afford the time to go to and from the store so often, always take their supply in bulk; for instance, in January they took the whole of their rice (7.40 pikuls) on one day, and in June their 7 pikuls in two portions on the 3rd and 15th of the month. In March, when I examined their diets, there was a good supply of fresh rice, namely, at the end of February, 169.24 pikuls (deducting again the 27.99½ pikuls), rather less at the end of March (158.11 pikuls), and a good supply at the end of April, namely, 185.56½ pikuls. It is curious that there were no cases of beri-beri among all the nationalities in February; only two in March among the Chinese, and one in April, months in which there was a good supply of fresh rice in use, and it may be of importance to recollect that rice, although mouldy or infested with worms, may be dried and winnowed in such a way that there is no apparent difference to the naked eye between it and rice which is known to be good.

EXPERIMENTAL TESTS.

The only experiments which I was in a position to make were of a simple nature. Equal quantities (two ounces) of fresh Rangoon rice, mouldy rice and rice infested with worms were well washed, thoroughly cooked and set aside in the open air for forty-eight hours. At the end of that time a greyish mould appeared first on the mouldy sample and this was quickly followed by a light brick-red mould, which in point of time next formed on the sample taken from the bag infested with worms, but only appeared slightly on the sample of fresh rice at the end of the third day. Fresh Siamese and fresh local Kelantan rice were treated in the same way and the pink mould did not appear on either until the third day, and then first in point of abundance on the Kelantan rice. From the preceding experiments it would appear that mould on rice is not destroyed by boiling, as it formed sooner on the bad samples of rice than on the good samples.

It seems not unlikely that Chinese cooking pans, unless thoroughly cleaned daily, might become contaminated in this way, as well as tubs of water in which rice bowls and spoons are washed on the conclusion of a meal, by reason of rice falling into the tub and decomposing therein.

To remark, in conclusion, on the occurrence of beri-beri in the Sokor district, a small place in the jungle of a new country, where the means of communication

are not good and where it is necessary to store a large quantity of imported rice, no management, however carefully thought out, could, I think, prevent a loss through deterioration. It is the usual experience in all mining camps in this part of the world, where climatic conditions are very unfavourable for the storing of this kind of food supply. I think it would be unfair also to brand Rangoon rice in particular as being specially unwholesome; most, if not all, of the other varieties of rice for sale in the East would, I think, sooner or later deteriorate in the same way under the same conditions. A solution of the difficulty in fertile places where rice in the husk can be obtained cheaply, might be to mill the local rice on the spot in such quantities as may be required from time to time, but other cereals, especially those which are supplied in bags, may also become mouldy or otherwise deteriorated. Besides these, also in local use, are sago and tapioca, which are exported to Europe from Singapore, as well as "dal," a small green pea which is imported, and three or four varieties of beans which are used locally, especially by the Chinese, who also favour two kinds of dried mushrooms.

I am indebted to Mr. W. Graeme Anderson, of the mining department of the Company, as well as to the General Manager and the Accountants for the help which they have given me in preparing these notes.

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"Lancet," July 7, 1906.

THE ACTION OF THE SERUM OF VARIOUS MAMMALS ON THE PLAGUE BACILLUS.

Lamb, G. and Forster, W. H., from experimental research in the serum of man, monkeys, horses, oxen, sheep, goats, rabbits, guinea pigs, and rats, conclude that no bactericidal action against the bacillus pestis is resident in the serum of any of these animals. In fact, the serum of all the animals mentioned proved to be an excellent medium of cultivation. To whatever, therefore, the immunity of some animals against plague is due, it would not seem to be resident in the serum.

"Il Policlinico," June, 1906.

RONTGEN RAYS IN MALARIA.

Demarchi, A., concludes from experiments that X-rays have no effect on the course of malarial fever, either as regards relapses or on the development of the parasites. The reduction of the size of the spleen noted after treatment by X-rays only sets in when the parasites have disappeared from the blood by medicinal treatment.

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BRITISH SPAS SUITABLE FOR TROPICAL RESIDENTS.

HARROGATE.

EVERY one knows about Harrogate, although they may never have been there, and we are reminded of its existence from time to time by elegant pamphlets detailing its virtues. Perhaps more than any other Spa in Britain is Harrogate visited by patients from warm climates in summer; they are sent thither by their doctors for the most part, but as often as not the doctor is asked, "Do you think Harrogate would suit me for a change?" Patients from the tropics suffering from the common Tropical ailments of liver or malaria do well at Harrogate during Summer. For such patients the seaside is useless, and worse than useless, it is harmful.

During the months of July and August those who have come home with malaria, anæmia, and enlarged spleen are almost certain, if resident in a town in the South of England, to get fever, probably of a remittent type, for two or three years after settling at home. Nor does the trouble cease there, for as the hot weather of July returns during several, it may be many, subsequent years, ailments such as neuritis, gastric catarrh and hepatic congestion, lumbago and several minor but annoying and depressing conditions

seem to assert themselves. What is to be done with patients suffering from their summer relapses of old malarial infection? Send them to a seaside town on the South Coast, because it is the nearest approach obtainable without going abroad to the climate from which they came? No, the sea level favours hepatic congestion, and the malarial parasite or toxin thrives in the warmth. Send the patient to a Continental Spa? People who have been abroad for many years do not want to be sent away as soon as they reach home; if they are ill they do not care to be amongst strangers, and if they are suffering from any form of tropical ailment they would be well to keep away from Continental Spa doctors, whose practice consists of "curing" the congested livers of over-fed European residents, and not the run-down tropical-marked and bleached specimens of humanity one is wont to meet with amongst old Tropical residents. A Continental Spa? No! Where, then, are there any principles to guide us in choosing a place of "cure?" High ground, bracing air and a fairly cool atmospheric temperature are the three requisites for a place suitable for "delicate" tropical residents in the months of July, August and September, for at least five years after their return from the Tropics. In England we must go northwards for these requisites, and at Harrogate, Buxton and Matlock we find for the most part what we require.

The Harrogate urban authorities are evidently quite alive to the commercial value of an impressive and pleasant environment to enhance the attractions of their valuable possession—the mineral springs. The Stray, an open space really of some 200 acres, runs through the centre of the town; its well-kept paths and plots testify to the attention bestowed upon them. The Royal Baths building in Harrogate is acknowledged to be the finest in Europe, and yet few English people have ever even heard of them. Continental spas and their doctors' names they know intimately, and can tell off-hand the nature of the waters at each and the ailments they are good for; but British Spas, their waters and their doctors are unknown to the majority, and, as usual, the Briton's ignorance of what he has in his own favoured isle is supreme. What is it that is wanted? A kursaal, beautiful walks, interesting surroundings, or is it medicinal waters, baths and treatment. In Harrogate there are all these, and there is the cool bracing air of Yorkshire, which is perhaps the greatest attraction of all. The advice to be given to tropical patients resident in England as to where to go in summer, is simple enough. Harrogate or Buxton in England; Morayshire, Nairnshire or the east of Ross-shire (Strathpeffer) in Scotland; or inland in Norway. At other seasons of the year there are British spas further south, where the invalid from the tropics will find himself or herself in congenial surroundings. Each place has its season, and, by judicious selection, the resident abroad can spend his leave or choose his holiday at places within his native shores—at home, in fact, for any part of Britain is home to those who have been long resident abroad.

The mineral waters of Harrogate are, however, after all, the essence of the "cure." This fact is apt to be forgotten, not only through the attractions and environment of the town, but the varieties of treatment at the baths are so numerous and so elaborate that the medicinal properties of the waters run a chance of being relegated to a position of but little importance. This should not be so; at any place we can have douches, needle baths, liver packs, massage with all its infinite and detailed varieties; but the Harrogate waters are Nature's gifts, and it is for these we seek after the place. Harrogate is doubly gifted in this respect, for it has a sulphur water, and a chalybeate and iron water. We cannot supplant natural waters by any artificial laboratory production. The chemist's analyses may be perfect, and his synthetical combinations may be exact; yet he cannot give us what Nature supplies to us. So it is with the mineral waters, we must go to them; they cannot be brought to us, nor made for us. Were we to attempt to imitate the sulphur waters of Harrogate by prescription, it would extend to a length which even the physician fond of drugs would scarcely dare to imitate. The constituents of these waters consist of: Sodium sulphydrate, sodium sulphide, barium chloride, strontium chloride, calcium chloride, magnesium chloride, potassium chloride, lithium chloride, ammonium chloride, ammonium carbonate, sodium chloride, sodium silicate, magnesium bromide, magnesium iodide, calcium carbonate, magnesium carbonate, ferrous carbonate, potassium carbonate, sodium carbonate, sodium iodide, barium sulphate, barium carbonate, strontium sulphate, strontium carbonate, calcium sulphate, sodium nitrate, silica, sulphuretted hydrogen, carbon dioxide, carburetted hydrogen, nitrogen.

The effect of the combination of these salts and gases upon each other, who will venture to elucidate? and the physiological chemist may well stand aghast when asked to state what their combined effect may be when introduced into the human alimentary canal. Yet such is Nature's plan of prescribing, and we are left in wonderment, wholly incapable of imitating or understanding her methods of combination to effect a cure.

(*See also Cheltenham, p.* 274).

THE DEPRECIATION OF THE ATTRACTIONS OF THE INDIAN MEDICAL SERVICE.

In previous articles we have already drawn attention to some of the causes that tend to mar the efficiency of the Indian Medical Service and to lessen its attractiveness as a field for professional enterprise, but have hitherto confined ourselves to points of a public character rather than to those that concern the prosperity of the individual officer. On the present occasion, however, we propose to consider a point of the latter sort.

There can be no doubt that the privilege of engaging in private practice has contributed enormously to the efficiency of the Indian Medical Service and to its popularity as a career; and, so far as we are aware, it has never been pretended that it has been abused to the detriment of the public service.

Anglo-Indians outside the medical service have always held most exaggerated ideas as to the emolu-

ments obtainable from the service, but still, twenty years ago, any civil surgeon might fairly expect to supplement his pay by £100 to £200 a year from this source, and in the larger stations his income might even equal that of a covenanted civilian of his own standing. All this, however, is a thing of the past, as far as the smaller stations are concerned, and is woefully diminished in the larger.

In each province there are some few stations which still retain some attractions from this point of view, but these are very properly the reward of prolonged good service, and, practically speaking, up to fifteen years' service or thereabouts, the less an officer expects to gain from this source the less will he be disappointed. There are various causes for this. In the first place, we have trained in our Indian universities large numbers of highly qualified native practitioners, whose habits of life enable them to charge fees much smaller than it would be either remunerative or fitting for an European officer to accept, and to this may be added the unavoidable unpopularity of all medical men trained on the European system, as the outcome of the efforts of the Indian Government to cope with plague. Owing to this a large proportion of patients who in old times would have consulted the civil surgeon or his assistants, according to their means, now resort to the *unani haqim* or Hindu baid, and it is only when these have failed and the sick man is past all human aid, that the European practitioner is called in, and when he is so, it is obvious can expect but scanty emolument or credit from the contingency.

All these adverse conditions might, however, be expected to yield to the personal influence of a really skilful and energetic officer, were it not for the needless way in which medical officers are harassed by constant changes of station. A remunerative private practice can no more be built up in a day or a month in India than in any other country, but an individual officer's tenure of any station rarely exceeds a year, and is often a matter of a few months only. An amiable desire on the part of the powers that be to treat their servants fairly is no doubt largely responsible for this, but to the victims of this misplaced affection the results are little short of ruinous. To account for how this comes about it is necessary to explain the plan on which the Civil Surgeon's official emoluments are calculated. The Government first docks fifty rupees from his military pay, and then compensates him by certain additional charges, the value of which varies in different stations. Thus the superintendentship of a district jail is paid from 50 to 150 rupees a month and in the majority of stations this is the only additional charge, but in other places there may be the medical charge of a railway, of a lunatic asylum, coolie department, remount establishment, &c. To give an example: in the Punjab, the Civil Surgeons of Simla and Murree draw 50 rupees per mensem less than their military pay, while those at Heshiapur and Gujrut find their position unaltered. Ludiana and Hirsar draw 25, Gujranwalla, Ferozepur and Delhi 50, and Multan 100 rupees more than their military pay. Now, in order to give all their share of these good things, it is customary when a senior goes on furlough or retires to institute a sort of game of general post, each officer stepping up into the next best place; but as the expenses of the move, for which he is allowed a fare, two first class fares swallow up one or two months of his entire pay, he is far from being a gainer by the change, and we would plead that greater consideration should be exercised in this respect, and that all unnecessary changes should be avoided, the more as they are even more undesirable from the official point of view than they are on private grounds, for local knowledge is of the first importance to the efficient conduct of a civil surgeon's duties.

Hitherto we have been considering the position of the ordinary civil surgeon, but in the political branch of the service the conditions are far worse, and are the outcome of deliberate efforts on the part of Government to reduce this source of income.

Indian noblemen are accustomed to regard it as only consonant with their position to reward handsomely their professional advisers, and generally the amount of the fee was left to the patient, though usually the sum tendered was only about what would be expected by a leading practitioner in England from a wealthy client. Some years ago, however, a native chief, choosing to consider that he owed his life to the exceptional skill of his medical attendant, presented the latter with the handsome fee of a lakh of rupees, or about £7,000. The gift, though princely, was, it must be remembered, entirely spontaneous, and astonished no one, probably, more than the recipient. The Indian Government, however, which had hitherto made no regulations on the subject, ordered the officer to refund the entire sum, but he preferred to send in his papers, and has since, by his talents and originality, attained a far better position in England than he could have ever expected to gain in India. Thereupon were instituted a series of orders on the subject, which have gradually been made much more stringent, till they are now so inquisitorial and humiliating that some officers prefer to refuse all remuneration rather than be subjected to the indignity involved in claiming a fairly earned reward.

Charges which would be regarded as reasonable in any part of England, and which have been passed as moderate by the medical administration are returned to the latter, it is said, with some insulting endorsement such as "perfectly monstrous," and officers have been left without any payment whatever, and punished for making charges based on the ordinary scale of fees customary in India. For example, the heir of a reigning chief was affected with a chronic tubercular bone affection. For over a year the Agency surgeon was in daily attendance, and often called up at night. He kept an account of his visits and charged the ordinary Indian fees, but the claim was rejected as excessive, and he was further punished by removal, not receiving a penny for his long and anxious attendance. The indignant chief, naturally considering himself dishonoured by the transaction, refused to call in the new Agency surgeon and resorted to a native haqim, who, of course, had no medical training whatever in the European sense, and this worthy really did charge in a style that might fairly be called monstrous—but as the haqim was a free agent the chief had to pay. The net result was gross injustice to the unfortunate medical officer, deprivation of proper medical treat-

ment to the patient, and an extortionate bill to his father, the chief. As a matter of fact it is practically most desirable that Agency surgeons should act as medical attendants to the chief when the latter desires it, for the friendly relations that necessarily result between him and a member of the Agency staff, are frequently of the greatest value in smoothing over difficulties, and everyone "in the know" is aware that it is quite common for the wholesome influence so gained by medical officers to "save a situation."

There is no good reason whatever why these humiliating regulations should not be entirely abrogated. No regulations could possibly prevent a really unscrupulous man from quietly accepting what he would be perfectly right in considering was honestly his due, and the mere fact that they suffice to prevent this is enough to show that the service is not made up of men of the sort, and that the rules are therefore quite needless. Further, they are resented by the chiefs even more acutely than by the medical officers, for they naturally argue that if they may not choose their own doctor, and honestly pay his bill, they are far less free agents than persons who have not the misfortune to be "ruling" chiefs.

As a rule no other qualified medical man is available, and the outcome is that they must either do without proper medical attendance, or be placed in a most disagreeable position of obligation to a man whose income is a mere bagatelle compared with their own.

Enough, however, has been said to show that the interference with private practice of this class is useless and needless, and that it is vexatious and humiliating to all concerned, and to none more than to the persons it is ostensibly designed to protect.

We should be the last to deny that the Indian Government has not only the right but the duty of maintaining the highest possible standard of professional honour in all branches of the service, and with human nature what it is, it is inevitable that cases should occur which call for the strictest disciplinary action.

Far from regarding such severity with disapproval the members of the service would be the first to applaud the prompt dismissal of an extortioner or blackmailer, but perhaps not the least extraordinary feature of the case is the reprehensible levity with which one or two such cases that have happened in the last twenty-five years have been dealt with. That such men should be given "another chance" is simply regarded as a blot to the fair pages of the nominal roll, in which the Indian Medical Officer justly feels the greatest pride.

No one denies that such cases will occur, and must be dealt with, but this is no defence for legislating for an honourable service, as if its members were a den of thieves, and as long as these rules are retained it is impossible for the Indian Medical Officer to feel that he is being treated not only as an officer, but also as a gentleman.

TUMOUR AND CANCER AMONG THE NATIVES OF ANGOLA.

Dr. F. Creighton-Wellman, Benguella, West Africa, in a communication to the American Society of Tropical Medicine, states that malignant tumours are uncommon amongst the natives of the district in which he is quartered. Of non-malignant tumours keloidal fibromata are by far the most numerous. The actual figures are:—Sarcoma, 2 cases in young women; multiple fibromata, 1 case; keloidal fibromata numerous; myxoma 1 case of nasal polypus; chondroma, 1 case; papilloma, warts, cutaneous horns, and bilharzial papillomata, rare; lipoma, several; hydrocele, not uncommon.

Dr. Wellman's experience extends over several years, and he has had the opportunity of examining many natives.

THE BIRTH-RATE IN THE PUNJAB.

Effect of Plague and Malaria.

The sanitary authorities in the Punjab state that the influence of plague on the birth-rate is of an indirect and general nature only; and that in spite of the fact that there were 334,897 deaths from plague in 1905, the birth-rate in the Punjab rose from 41·5 to 44·4 per thousand of the population. It is noticeable that more women than men die of plague in the Punjab, a fact probably owing to women being secluded indoors and therefore more in contact with the sources of infection. The birth-rate would seem to be lessened more markedly by the prevalence of malaria than of plague. A severe malarial outbreak in the autumn is reported to affect the birth-rate in the following year more than any other form of disease. For four years in succession the death-rate in the Punjab has been higher than the birth-rate; and the Punjab has recently had the highest death-rate of any district of India, amounting to no less than 47·55 per thousand.

PRIZES OFFERED FOR DISCOVERY OF THE TYPHUS FEVER GERM.

The Mexican Government have offered three prizes of $20,000 each for (1) the actual discovery of the typhus germ; (2) its mode of transmission to man; (3) and of a successful preventive or curative serum or effectual remedy. Communications to be addressed to the Secretary of the Academy, Dr. D. I. G. Cosio, Ortega 9, Mexico.

The reason for this liberal offer is that typhus is prevalent in a part of Mexico at the present time where, under the name of "tabardillo," the disease has attacked some 860 persons, of whom 185 have died. Dr. Terres, of Mexico, has published several facts in connection with the prevalence of typhus in Mexico. He states that the disease is not transmitted by direct contact; that it is seldom met with below an altitude of about 2,000 feet, whilst it is endemic in nearly every town above this altitude; the disease is especially prevalent during dry seasons.

Dr. Ignacio Prieto, of the National Pathologic Insti-

tute, Mexico, states he has isolated a streptococcus from the cerebro-spinal fluid of typhus patients, which he thinks may be the causal germ. It frequently appears as a diplococcus. Inoculation of animals has proved positive, the time of death varying according to the strength of the injection. There is said to be some difference in the clinical signs between the Mexican and the European type of typhus, in as much as the Mexican variety does not reach its maximum temperature for three or four days. Moreover, the temperature is first intermittent, then remittent, and finally becomes continuous in the Mexican variety.

Notes and News.

MOSQUITO BITES.—Schill, in the *Schweizer Woch. für Chemie und Pharmacie*, advises applying a paste or saturated solution of bicarbonate of sodium to the bitten part. Thymol, 50 per cent. alcoholic solution, applied to hands, neck and face, is effective in keeping off mosquitoes.

EUROPEAN AND AMERICAN AILMENTS.—At one time gout, glycosuria and multiple sclerosis, were regarded as rare diseases in the United States of America, and in text-books the rarity was insisted upon. Whether the people of the United States were really less seldom afflicted with any one of these troubles than were the European parent stock, is a matter of opinion. At the present time, however, the several ailments mentioned are as prevalent in one Continent as in the other.

AN INGENIOUS MOSQUITO DESTROYER.—Professor Blanchard showed at a recent meeting of the Académie de Médecine, Paris, an invention by M. Chaulin, devised to destroy mosquitoes. The apparatus consists of a small metal cage within which is an electric light. The cage is connected with a battery whereby an alternating current is made to traverse the wires of the cage. The mosquito is attracted by the light to settle on the wires and is promptly electrocuted.

MISS R. A. BETTY, Senior Lady Superintendent of Queen Alexandra's Nursing Service for India, has been decorated by His Majesty King Edward with the Royal Red Cross, in recognition of her services in India.

ST. HELENA.—According to the official report for 1905, measles appeared in March, 1905, and up to August 28th, 1905, when the last case occurred, no fewer than 500 persons were attacked. Seeing that the total population of the island amounts to only 3,761, it would appear that almost one-seventh of the inhabitants contracted the disease. No one died of the disease except one person, aged 52, who was also the subject of malignant disease. It is sixteen years since measles visited St. Helena, so that the low death-rate is rather remarkable.

ENTERIC IN INDIA. — STANDING COMMITTEE APPOINTED.—The Government of India have sanctioned the formation of a Standing Committee for the purpose of investigating and advising on enteric fever in India and its prophylaxis. The first meeting was held at Simla on July 31st in the United Service Institute.

The undermentioned officers, nominated by the Commander-in-Chief, have been appointed on the Committee:—President: Surgeon-General Gubbins, P.M.O., His Majesty's Forces in India; Vice-President: Surgeon General Scott Reid, P.M.O., Northern Command; Members: Colonel Forman, P.M.O., Bombay Brigade; Lieutenant-Colonel T. P. Woodhouse, Captains L. W. Harrison, E. B. Knox (secretary), A. B. Smallman and Lieutenant Luxmoore, Royal Army Medical Corps. Nominated by the Home Department — Members: Lieutenant-Colonel Leslie, Sanitary Commissioner with the Government; Lieutenant-Colonel Semple, Director of the Central Research Institute; Major G. Lamb and Captain Greig, I.M.S.

A SMART shock of earthquake was felt at Simla and at Naggar (Kangra District) on July 21st, and slighter shocks at Lahore and Dalhousie.

INFECTIOUS DISEASES HOSPITAL AT COLOMBO, CEYLON. — News has been received that a lady travelling home with her children from Calcutta had a most unhappy experience at Colombo recently. One of the children developed small-pox at sea, and on arrival at Colombo, the family were taken to the infectious diseases hospital. Instead of finding a properly equipped hospital, Mrs. Craig and her children found a shanty with a couple of untrained Cingalese in attendance. The isolation rules prevented the mother from seeing her sick child, and the attendants were altogether unfitted to look after an European child of three years. The child died, and when the whole of the facts of the case were made known by Mr. W. J. Craig, who had been summoned to Colombo by his wife, the indignation aroused was general. Sir Henry Blake, the Governor, made a private surprise visit to the infectious diseases hospital and declared it to be a disgrace to the Colony. A site for a new hospital has since been decided on. —*Times of India*, July 28th, 1906.

THE annual (1905) report on vaccination in Burma states that: "Out of a population of 10,500,000 the total number vaccinated were 500,000. Two hundred vaccinators were employed; the cost of the work amounted to 114,000 rupees."

WE have to hand the current "Special Plague Number" of the *Indian Medical Gazette*, which should be obtained by all interested in the subject, as, for the most part, the papers included in it are of a high standard of excellence and are, moreover, of a most practical character. Perhaps the most noteworthy point is the fact that almost without exception, Captain Glen Liston's rat-flea theory of the etiology of plague is accepted as substantially proved; and such being the case we are obviously within measurable distance of a really practical and practicable plague policy for India. There are many Hindu

sects that would have some objection to the killing of rats, and who might, at any rate, refuse to assist in such operations, but except the Jains, who, like Gilbert's Koko in the Mikado, "can't kill anything," few would have any scruples as to the slaughter of fleas, so that the use of insecticides is not likely to rouse opposition. That the contributions should not be of uniform merit is only natural, and in one case it is certainly difficult to understand how the author persuaded himself that he had anything original to communicate. This paper is rendered all the more irritating by its slipshod English.

Here, no doubt, we have the keynote to the title selected for this paper, and it is one which cannot fail to be of very great interest to all medical officers in this country, and in particular to those engaged in efforts to subdue it.

This is a complete paragraph, and if anyone can say to what substantive the final "it" stands pronoun their powers of analysis must far exceed the average. Does the "it" refer to the "keynote," the paper, or the country? In view of such a gem of construction, one is left in doubt whether mere carelessness or ignorance has led the author to speak of *Pulex cheopis*, Rothschild, as "the" rat-flea. As rats commonly harbour several species of *Pulicidæ* no one of them can fairly be called "the" rat-flea; but if any flea has a right to the title, it is *Ceratophyllus fasciatus*, which is found on rats all over the world, whereas *P. cheopis* has only once been recorded in temperate climates, and—if so spoken of at all—would probably be better called "the jerboa flea." As, however, most fleas will attack a variety of hosts, it is misleading to speak of any of them as appertaining to any particular animal. After all this, it is not surprising to find that the writer regards the *de novo* origin of bacteria as possible, albeit not proven. Not the least valuable portion of this excellent number are the able series of editorial comments which together form a most handy commentary of our present knowledge of this most difficult subject.

Major J. Chaytor White, I.M.S., at present on leave in England, has been deputed by the Government of India to visit a number of Municipalities in England, with the view of studying the working of recent sanitary improvements.

Captain James, I.M.S., in an interesting report, discusses the old idea that Kala-azar has any relationship with malarial fever, and appears extremely sceptical as to the so-called disease having any connection with the Leishman-Donovan parasite. It is interesting to note that the Government entomologist has found in Assam a "near ally of the tsetse fly," and suggests that it may have some connection with the disease. The *Indian Pioneer* very pertinently remarks: "If the scientific authorities do not hurry up the disease may have died out before its origin is discovered, for it is certainly decreasing steadily in virulence. In 1897 some 18,597 deaths were reported in Assam as due to Kala-azar; last year there were only 3,030." And in favour of Captain James' views it may be noted that there is no evidence of any coincident decrease, either of malaria or of the Leishman-Donovan parasitic disease, though in the latter case too little is known as to the diffusion of the malady to render any conclusions practicable.

The death rate from cholera in Eastern Bengal and Assam was last year more than double that of the preceding decade. In Dacca city the Civil Surgeon effectually stamped out the disease by prompt treatment of all tanks and wells with permanganate of potash. One is tempted to ask why this measure was not employed elsewhere; but we are aware that it is not always possible to carry out sanitary measures as could be wished in India; and the reason, in the present instance, is probably to be found in the political unrest which has attended the establishment of the new province. Dacca, however, is a great Mahomedan centre, and it is noteworthy that the members of this community, though sometimes accused of backwardness, are often less difficult to deal with in sanitary matters than their Hindu fellow-countrymen.

Personal Notes.

Indian Medical Services.

Arrivals Reported in London.—Major W. J. Buchanan, Major J. B. Jameson, Col. H. K. McKay, Captain J. C. A. Kunhardt.

Extensions of Leave.—Lieutenant-Colonel P. D. Pank, 2 d. furlough; G. F. T. Harkness, 3 m., medical certificate.

Permitted to Return to Duty.—Lieutenant-Colonel P. D. Pank, Captain T. H. Symons, Surgeon-General W. R. Browne, C.I.E.

Postings.

Lieutenant Steel officiates as Assistant-Director, Bacteriological Laboratory, Bombay.

Captain R. F. Baird officiates as Civil Surgeon, Farrukhabad.

Dr. H. A. Macleod, Civil Surgeon (uncovenanted service) from Saharanpur to Mugaffanagar.

Captain U. S. J. Shaw officiates as Superintendent Royal Lunatic Asylum.

Lieutenant-Colonel Harrington officiates as Chief Medical Officer, Rajputana.

Major P. Haig, Residency Surgeon, West Rajputana States, to the additional charge of the Agency, Jodhpur.

Captain H. Mackenzie, services temporarily lent to Government, Punjab.

Lieutenant C. Henderson, 29th Lancers, to Burmah Military Police.

Major W. Vost to be Civil Surgeon, Gorakhpur.

Leave.

Major W. R. Clark, Civil Surgeon, Umballa, combined leave, 2 y.

Retirements.

Lieutenant-Colonel J. Maitland, Madras.

Senior Assistant Surgeon Captain Staggs, I.S.M.D.

List of I.M. Officers in Military Employ, on Furlough.

Abbot, Captain S. H. L., 12 m., May 4th, 1906.
Anderson, Captain D.N.
Babington, Lieutenant J. W. H., 1 y., September 27th, 1905.
Baker, Captain D. G. R. S., 8 m., May 16th, 1906.
Bradley, Captain R. J., 8 m., April 2nd, 1906.
Brown, Captain H. R., 18 m., April 15th, 1905.
Buchanan, Major W. J.
Collinson, Captain W. J., 1 y, June 9th, 1906.
Cruddas, Captain H. M., 1 y., March 13th, 1906.
Earle, Major H. M., 1 y., April 29th, 1906.
Eyre, Lieutenant-Colonel, M.S., 18 m., September 23rd, 1905.
Fooks, Lieutenant-Colonel H., 19 m., March 28th, 1905.

Gilbert, Major C. E. L.
Graham, Captain J. D., 1 y., April 16th, 1906.
Groube, Captain G. P. T., 1 y., April 14th, 1906.
Hagger, Captain R. L., 8 m., February 16th, 1906.
Hamilton, Captain W. G., 17 m., October 5th, 1905.
Hamilton, Colonel H., C.B., 6 m. 18 d., April 28th, 1906.
Harkness, Lieutenant G. F. L., 9 m., February 15th, 1906.
Harriss, Major S. A., 6 m., May 6th, 1906.
Illius, Captain H. W., 1 y., March 19th, 1906.
Johnson, Major C. A.
Kirkpatrick, Captain H.
Kunhardt, Captain J. G. G.
Lee, Lieutenant-Colonel W. A.
Lister, Captain A. E. J., 21 m., February 12th, 1905.
MacKelvie, Captain M., 12 m., October 15th, 1905.
MacRae, Colonel R., 7 m., May 4th, 1906.
Maidment, Major F. G., 1 y., March 21st, 1906.
Marr, Captain C. F., 1 y., April 24th, 1906.
Mason, Captain W. G., I.S.M.D.
Meakin, Captain H. B., 18 m., March 23rd, 1905.
Murphy, Captain A., 8 m., June 6th, 1906.
Parker, Captain C. S., 18 m., August 28th, 1905.
Pinchard, Captain M. B., 18 m., August 12th, 1905.
Pratt, Lieutenant-Colonel H. J.
Pridham, Captain A. T., 7 m., March 18th, 1906.
Reynolds, Captain L., 9 m., March 4th, 1906.
Rodgers, Lieutenant-Colonel J. W., 52nd Sikhs, 1 y., January 26th, 1906.
Russell, Major A. R. P.
Sarkies, Lieutenant-Colonel C. J., 290 d., April 19th, 1906.
Stephen, Captain J. P., 1 y., June 24th, 1905.
Swaine, Lieutenant-Colonel C. L.
Tate, Captain G., 1 y., October 3rd, 1905.
Thompson, Captain F. T., 54th Sikhs.
Tuke, Captain A. W., 9 m., May 1st, 1906.
Turner, Major R. G.
Whale, Captain H., 8 m., June 5th, 1906.
Wilcocks, Captain R. D., 17 m., May 27th, 1905.
Younan, Lieutenant-Colonel A. C., 1 y., March 1st, 1906.
Youngerman, Lieutenant-Colonel E. P., 1 y., March 2nd, 1906.

INSPECTION OF ALLEN AND HANBURY'S WORKS AT WARE, HERTFORDSHIRE.

THE admirable way in which the arrangements for the representatives of the press on their recent visit to Messrs. Allen and Hanbury's factories at Ware, Herts, were carried out convinced the visitors, even before they left by special train from Liverpool Street, that a capable and enterprising spirit must be at the head of affairs, and that something out of the ordinary was in store for them. Those anticipations were more than realised, and a thorough inspection of the works and minute examination of the many ingredients employed in the manufacture of the firm's numerous capsules, lozenges, &c., and the celebrated Infants' Food, could leave no doubt that everything was of the finest and purest quality, and the processes of transforming the raw materials into the desired results were carried out under the best of sanitary conditions. The factories stand in their own grounds, comprising some acres of grazing land, occupied by a large herd of cows whose milk is used in a variety of Messrs. Allen and Hanbury's products. In these days of scares by potted and tinned foods it is always as well to do what one can to remove biassed impressions, and so far as Messrs. Allen and Hanbury's packing and the supervision exercised in hermetically sealing and keeping air-tight their delicacies and preventatives of, and remedies for sundry, ills are concerned, it is only right to say they could not be surpassed, and consequently a minimum of damage is likely to be caused to them by climatic influences.

CHELTENHAM.

THE OPENING OF THE NEW SPA.

FOR those who have spent the active part of their lives in warm countries, and as a place of education for their families there is no more desirable and popular town to reside in than Cheltenham. The education for children is excellent, both for boys and girls, and within the means of all. In former times Cheltenham was famous for its mineral waters, but of late years the reputation of the town as a place of "cure" has been unaccountably and most unjustifiably neglected. It is satisfactory, however, to know that as a place of "cure" the Cheltenham authorities have taken a step in advance, and the opening of the new Spa cannot fail to prove an attraction to many. Just now "Garden Cities" are much talked about in England as if they were something new, but we have in Cheltenham one of the finest garden cities, not only in England, but in Europe. Being an old-established resort, it is without the drawback of the much vaunted modern imitations. The *Journal of the Royal Institute of Public Health* remarks:—"It would be difficult to exaggerate the advantages of the place from the point of view of residence. It is well situated, the shops are admirable, and the means of amusement greater than at most English health resorts. The climate of Cheltenham is of a distinctly sedative type. The humidity is considerable, making the conditions particularly equable. It is, like most of our western and south-western stations, admirably, or rather pre-eminently, suited to the very old and the very young. For those who have done their life's work, especially in some tropical climate, such as India, there is no better place in Europe than Cheltenham. All this has been long recognised, and one has only to go to Cheltenham and make acquaintance with its inhabitants, to realise that the population is largely made up of people who have been abroad and those who have children to educate.

"From the spa point of view, the waters are comparable to those of Brides-les-Bains, St. Gervais, Homburg, Kissingen, and others, which contain chiefly the chloride of sodium and the sulphate either of sodium or magnesium, or both. Inasmuch as it constitutes the only drinking-water spa of this type in England, and, judging by the spirit which now seems to animate its authorities, it certainly ought to have a great future before it.

"Of the New Central Spa, which the Corporation of Cheltenham has recently established in the Town Hall, we may say at once that any town which is capable of building a Town Hall such as that which now graces Cheltenham, ought to be capable of anything in the way of enterprise to render the town successful and attractive from the health resort point of view. It would be difficult to imagine anything, even at Continental stations, more suited to the requirements of a health resort than the magnificent

building in which the Central Spa is now situated. It is, in fact, a casino of splendid dimensions, admirably designed and tastefully decorated.

"Cheltenham has this peculiarity, that its climate is essentially a winter climate, and there is no health resort presenting the same type of waters to which patients can be sent in the winter. This is an advantage of which the authorities would do well to make full use."

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

The "Indian Medicine Gazette," Special Plague Number, July, 1906.

(1) THE SPREAD OF PLAGUE.

Browning-Smith, S., Major I.M.S., from experiences gained in the Punjab, is of opinion that in the spread of plague (1) the rat is the principal disseminator; (2) that the rat is a necessary factor for epidemic bubonic plague; (3) flea prevalence is also necessary; (4) a plague epidemic will end with the disappearance of either the rat or the flea; (5) seasonal variations of plague depend on flea prevalence, the habits of man and the breeding of fresh generations of rats.

(2) THE NATURAL HISTORY OF PLAGUE.

Stevens, A. F., Capt. I.M.S., draws special attention to the disseminating agencies of plague and classifies them into: (1) Universal or territorial dissemination, mostly by travellers, merchandise, parcels and correspondence and by animals; (2) regional dissemination by contiguous (urban) and local (rural) dissemination; rats and rat-destruction sums up the whole subject of the spread of plague and the means we have of combating the disease.

(3) HOW PLAGUE IS SPREAD.

Gordon Tucker, E. F., Capt. I.M.S., suggests practical palliative measures for municipal authorities to carry out when brought face to face with an epidemic of plague. They are chiefly erection of temporary dwellings in open spaces near evacuated houses for the poor, and outside the city for the richer classes. Disinfection of infected houses where a family accepts inoculation. Special laws to ensure good rat-proof dwellings for stables and granaries. Destruction of rats.

(4) PLAGUE IN THE CITY OF MADRAS.

Ross, T. S., Capt.. I.M.S., states that until January 20, 1906, indigenous plague was unknown. A few sporadic cases developed in different parts of the city, but although rats were found infected the disease never became generally prevalent. Some attribute the extraordinary exemption of anything like an epidemic of plague in Madras during all the ten years the disease has prevailed in India, to the absence of the *Mus decumanus*. The *Mus Rattus* and the *Nescocia bandicota* are met with, but the former is a non-burrowing animal and therefore does not pass from house to house freely for fear of being caught by the Bandicoot; in this way the Bandicoot has come to be regarded by some people as the means by which plague has been kept out of the city.

(5) HOW DOES PLAGUE SPREAD?

Elliott, Alex. M., M.B., mentions, amongst the several known means of spread, that cats are probable carriers of infection, and that from fleas taken off plague-infected cats, plague bacilli may be obtained. An interesting case is the probable infection of a man in India who picked up a dead rat dropped by a vulture; the fact that the buboes proved to be axillary in this patient is also suggestive and instructive.

(6) THE EFFECTS OF RAT EXTERMINATION ON THE INCIDENCE OF PLAGUE IN A SELECTED AREA IN AZAMGARH CITY.

Walker, J. W., Capt. I.M.S., draws special attention to the fact that plague epidemics, in smaller towns at all events, seem to be particularly severe in alternate years. The experiment of killing rats and mice by baits consisting of bread sprinkled with the "Common Sense Rat Exterminator" was carried out in the south-eastern district of Azamgarh. The result when the epidemic of plague visited the city was satisfactory, in as much as thirty-two cases were recorded against 133 in the north-eastern quarter, where no steps against rats had been taken and where the people lived under much the same conditions. A point observed in the rat-free area was that cases imported thither do not give rise to the series of infection to be seen in places where rats abound. The investigation was carefully and scientifically carried out.

(7) HOW PLAGUE IS SPREAD.

Allchen Gill, C., Lieutenant I.M.S., is of opinion that the part played by man in the spread of plague is of equal importance to the *rôle* of the rat. A plague epidemic in any place is usually preceded or accompanied by a mortality among rats, but if this is inquired into, in most cases it will be clear that the rat infection has taken place from man. The rat-flea *Pulex cheopis*, is evidently the chief intermediary host between rat and man, but whether as a mere transmitter or as an animal in which the bacillus of plague passes through an evolutionary stage, is unknown.

(8) AN EXPERIMENTAL INVESTIGATION AS TO THE POTENCY OF VARIOUS DISINFECTANTS AGAINST RAT-FLEAS.

Hossack, W. M. C., M.D., of the Plague Department, Calcutta, contributes a very interesting paper on the subject of rat-fleas and their destruction. He draws attention to the difficulty of being certain that the fleas have completely disappeared from the rat fur, even after careful search. He also shows that fleas, after being immersed for a time in fluid disinfectants, may promptly recover when allowed to escape from the liquid, even after many minutes of immersion. He finds phenyl 1-500 (roughly two tablespoonfuls to a bucket of water) is an excellent pulicide, paralysing the flea in a few seconds and killing it in about one minute. Izal, cyllin and crude phenyl are equally efficacious, but the perchloride of mercury, even in strong solution, 1-250, was disappointing. He advises giving up perchloride of mercury solution, which is in common use in India, in favour of one of the others mentioned. It must be remembered, however, that phenyl, izal, &c., has little power as a germicide against plague, and as Dr. Hossack remarks the substance that will give the best results as a pulicide and germicide has yet to be determined.

(9) RAT-KILLING FOR PREVENTION OF PLAGUE.

King, G., Captain, I.M.S., mentions several varieties of rats met with in Bihar and adjacent districts of India.

(*a*) *Field Rats.*—(1) *Gerbillus Indicus*, locally named "Hurna" (the Indian antelope or Jerboa rat), a field rat; (2) *Mus Mettada*, locally named "Kuroch," probably a large northern variety of the soft-furred field rat of S. India; (3) a field rat resembling the "Kuroch" rat, termed locally "Churhowa," but which Captain King cannot classify; (4) the *Nesokia Bengalensis* (the Indian mole rat); (5) the *Nesokia Bundicota* (the Bandicoot), termed locally "Ghous," the pig-rat. Of these field rats, 1, 2 and 3 do not burrow in outhouses; 4 and 5 are rare in Bihar and do not burrow in outhouses.

(*b*) *The House Rats.*—(1) *Mus Rufescens*, termed locally,

"Gach Kachuha," lives in trees, roofs of houses and holes in mud, walls, &c.; (2) *Mus Alexandrinus*. These rats are closely related in habits and in the fact that the tails of both are distinctly black, distinguishing them from all other rats. The importance of this feature is apparent when it is known that these two species are the transmitters of plague, and that when the extermination of rats is determined upon, it is the tails of the black rats that should alone be paid for, as rats with yellowish tails or black with yellowish fur over joints are innocuous, so far as plague is concerned. It would appear that the "*Mus Alexandrinus* is really the eastern variety of the European black rat, *Mus rattus*, which was abundant in Europe from 1347 to 1680, but is rare now, having been ousted by the brown (drain and cellar) rat, and by better housing and sanitation since the great plague epidemics in Europe between the above dates."

"Centralbl. f. Bakten," I. Orig., T. xl., p. 630.

THE ACTION OF *Aspergillus niger* AND *glaucus* ON CULICID LARVÆ.

Galli-Valerio, Bruno, and Rochazdi Jongh, J. The larvæ were placed in crystalising glasses, flasks, and casks of water, and sporulating cultures of the above species added. In the smaller vessels, the greater part of the culicids failed to survive the larval stage and only half the pupæ reached the adult condition. In the larger vessels the mortality was less severe, and the authors conclude that though in the natural state the larvæ may become infected, the method cannot be recommended as a practical measure, as the destruction dealt by either petrol or saprol is much more rapid and certain.

"Thomson Yates and Johnston Laboratory Reports," T. vi., Part 2, p. 139.

THE HABITS OF THE MARINE MOSQUITO (*Acartomyia Zammitii*).

Theobald, F. V., premises that there is little doubt that Malta fever is conveyed either by the above mosquito or by the biting fly *Stomoxys calcitrans*.

This mosquito is found throughout the Mediterranean littoral and is exceptional in passing its larval and pupal stages in salt marshes of a concentration of 48 to 87 grammes per litre. Should the salt commence to crystalise out the larvæ must either emigrate or die. Interesting details are afforded of the larval and adult life history of the insect. It may be remembered that Sergent has described from Algeria *Grubhamia mariæ*, a closely allied form, which also passes its larval stage in strongly saline salt marshes.

"C.R. Acad. Sciences," T. cxlii., p. 260.

THE ANATOMY AND HISTOLOGY OF THE IXODES.

Bonet, A.—A short study of the eye and poison glands of these arthropods. The poison glands consist of large pyriform cells, placed among the alveoli of the salivary glands, and distinguishable by their staining in acid solutions. They are more numerous in *Argas* than in *Ixodes*, which explains the greater irritation produced by the bites of the former genus. Their secretory activity is associated with nuclear emissions of the same character as the venin granules of other arthropods and of the ophidia.

It may be noted that the poison glands of mosquitoes also consist of similar voluminous pyriform cells.

"Scientific Memoirs of the Med. and Sanitary Departments of the Government of India."

THE ANATOMY AND HISTOLOGY OF TICKS.

Christophers, Captain S. R., concerns himself principally with *Rhipicephalus annulatus* and *Ornithodorus savignyi*, the latter being probably the camel tick, which Palton noted as also attacking man at Aden. A very complete account is given, with ample indications as to methods of examination, and in the last chapter some information is given on the structure of the egg and the embryology of the group. It is important to note that it is stated that the larvæ of *Ornithodorus* do not bite, whereas those of the *Ixodidæ* do.

"C.R. Acad. Sciences," T. cxlii., p. 1225.

THE EVOLUTION OF THE GYMNOSPOROUS GREGARINES OF CRUSTACEANS.

Leger, L. and Dubosq, O., revive Frenzel's hypothesis that certain gregarines parasitic in crustaceans, for which the latter instituted the genus *Aggregata*, have a double life history, and that the alternative host should be looked for among animals that prey largely on crustaceans, such as the cephalopods, and have submitted the question to experimental demonstration. They have never found the spores of *Eucoccidium*, from the intestines of cephalopods, open in the intestines of these molluscs, although they do so readily in the intestines of a variety of species of crabs, and the sporozoites when set free are actively mobile, and penetrate the epithelial cells of the crabs very readily. The greater part of them are stopped by the basal membrane, and undergo degeneration, but those that succeed in passing through it reach the peri-intestinal lymphoid tissue and grow into large young gregarines with a spherical nucleus and large karyosome, though many are in the meantime destroyed by the phagocytes. These stages agree with those already described by the authors in crabs naturally infected with *Aggregata vagans*, and they are led to believe that these intestinal gregarines of crabs have no connection with the cœlomic *Aggregata*, but there is reason to believe that they require an alternate host.

They further believe that *Aggregata* is the schizogonic and *Eucoccidium* the sporozonic stage of the same gregarine.

"Journal of Mental Science," April, 1906.

Knobel, W. B., Dr., discussing asylum dysentery in England, points out (1) that between acute inflammatory conditions of the colon and lesions of nerve cells and fibres of spinal cord, ganglia and atrophy of cerebral gyri, there is a distinct association. (2) Trophic influence is evidently impaired in insanity, hence the special susceptibility of the insane to dysentery. (3) The 'privy atmosphere' with which we are familiar in asylum wards may be due to this trophic impairment, and the air in the ward may be a factor in the spread of the complaint. (4) Many microbes, either singly or in mixed infection, may produce dysentery under certain circumstances. (5) It may be that dysentery is produced by some microbe normally present in the intestine becoming pathogenic, when the normal nerve stimulus is withheld. (6) It is significant that disturbance of the subsoil in the immediate vicinity of an insane asylum is apt to be followed by an outbreak of dysentery.

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Original Communications.

SPRUE AND CHRONIC INTESTINAL LESIONS.

I.—THE DIET IN SPRUE—MEAT—MILK—FAST DAYS—WHY FAST DAYS ARE NECESSARY—SEA WATER FOR RECTAL INJECTIONS.

II. — SIGMOIDO-RECTAL STRICTURE A CAUSE OF CHRONIC INTESTINAL FLUX — A SIGMOIDO-RECTAL PYLORUS—THE USE OF THE SIGMOIDOSCOPE.

By James Cantlie, M.B., F.R.C.S.

I.

Opinions concerning the milk *versus* the meat diet of sprue, and of other lesions associated with intestinal flux, still afford material for debate. The majority favour the treatment consisting of milk only, a few favour a rigid *régime* of meat or of meat juices, whilst a third group temporise with a modification of the two extremes, and give a hesitating adherence to each. The writer has for years advocated and practised a rigid "meat" diet in sprue, and experience has tended to confirm the efficacy of the plan.

Meat Diet.

Whilst still adhering to the meat treatment as *the* means of curing sprue rapidly and efficiently, an extended experience has served to modify the sweeping assertion that by this means alone sprue is always permanently cured. The reasons for this belief are stated below. That a patient in what under ordinary circumstances appears the last stages of the illness, that is, when, in addition to emaciation, anæmia, dropsical effusion, &c, there is a decided rise in temperature, can be saved by putting the patient on home-made beef tea, raw meat juice and beef jelly, administered in teaspoonful doses every ten minutes if need be, the writer has proved again and again. A rise in temperature takes place in most cases of sprue some two to four weeks before what seems inevitable death, in sprue. Milk in such cases means death, and by meat juices alone can a patient, in what seems the last stages of the illness, be saved.

The further treatment in such serious cases will be found to be that as the patient's strength improves, which it will do, the time of feeding may, after the first twenty-four hours, be lengthened to every twenty minutes on the second day, and to half hourly or hourly feeds by the third or fourth days. By the fifth day, pounded beef (from top of round) will be tolerated and enjoyed, and the diet intervals may be increased to two-hourly feeds; pounded beef, meat juice, beef tea, and beef jelly being taken *seriatim* at the intervals mentioned. In a week or a fortnight, if the cure advances satisfactorily, vegetables, bread and stewed fruit may be added with benefit. At this stage, or it may be later, a relapse usually occurs, and meat seems to have failed and the doctor and patient are disappointed. This contingency is almost inevitable, and the doctor reverts to milk, or the patient seeks other advice. This is the critical period of the treatment, and one that causes anxiety and trouble. The solution of this difficulty is the object of this communication.

Milk Treatment.

This is so well known that it is unnecessary to describe it. It is the least troublesome to administer, it brings about, except in late stages of sprue, solid stools, and, the diarrhœa being in abeyance, the patient is satisfied with the result. Withal, however, it does not, as a rule, cure. A sprue patient can only be said to be cured when he can revert to a mixed diet, and it is at the period when other substances are added to the diet, be they starchy or nitrogenous, that a relapse is apt to occur and the patient and doctor are disheartened and disappointed. The solid stool produced by a rigid milk diet is not fæcal; it consists of a mass of agglutinated milk curd from which the whey has been extracted, and on the whey alone the patient has lived, and, it may be, improved.

Can the milk and meat diets be combined? In the ordinary sense, No! Meat cannot be digested when milk or milky substances such as milk puddings are given at the same meal. In ordinary day life it is the custom to take a milk pudding after consuming fish, fowl, or butcher's meat, and on the other hand milk is often drunk at meals along with meat in place of beer, or wine, or water. Such a combination is physiologically wrong. The old Jewish law that milk is not to be taken until at least two hours after eating flesh holds good for all time, and cannot be contravened with impunity by healthy people, and therefore far less so in patients with gastro-intestinal disturbances. How then can a milk and meat diet be combined if both are useful in sprue. Not by taking the two together; not even by taking the two at separate meals but on separate days.

Fast Days.

The patient on a meat diet should, say, every third or fourth day, fast from meat of every kind, and take milk, and milk only, for twenty-four hours. The writer has found this to be the secret of success in the prolonged treatment of sprue. Meat diet is almost certain to be attended by relapses; milk diet when modified is almost assuredly attended by recurrences of diarrhœa, and the ordinary attempts at a combined diet are equally productive of failure; but a rigid milk diet alternating with a varied diet on separate days will seldom fail.

Why Fast Days are Necessary.

The writer has practised the "fast from meat" plan with success for some time, but could not frame an explanation until he read a paper by Sir Lauder Brunton on the effects of a rigid diet. In the paper and in conversations with Sir Lauder Brunton on the subject, the writer has come to firmly believe in his explanation of the good effects produced by meat fasts in cases of intestinal flux. Sir Lauder puts it shortly thus: The bacteria of the intestine can accommodate themselves to almost any food; if a milk diet has been persisted in, the sudden change to a purely meat diet places the bacteria, accustomed to deal with

milk only, at a disadvantage, they cease to be active and largely die out, and their pathogenic properties are annulled. If, again, the meat diet is persisted in the bacteria recover, and again multiplying become virulent, and show their pathogenic effects as pronouncedly as before. Change this suddenly and completely by again reverting to, say, milk, and the bacteria are once again hampered or largely killed; in time they become accustomed to the altered media of their environment and again become pathogenic. Whether this be the true explanation or not it fits in with clinical facts, and the writer has adopted it with success as a rational basis of treatment. Be the nature and cause of sprue what it may, a bacterial infection, a fermentation, or a mere physiological perversion, the explanation offered is justified, both scientifically and clinically. A change of diet, as of air, or of water, seems necessary to human welfare. In Britain we go for a change of air, in China it is said to be for a change of water that the invalid goes, and it is held by many that a "city" dinner is an excellent hygienic factor in the digestive economy. Change of "air" is not confined to man's requirements; animals, and more especially birds, find it necessary, although it may be for different reasons; and all animals in a natural state change their lairs or environment from time to time. The scientific explanation of this is probably based on hygienic factors, and would bear closer investigation with benefit. Sameness of diet is apt to lead to "staleness" of body and mind, a fact which it would be well also to probe more deeply. Advocacy of "fast days" from the stereotyped diet in sprue, therefore, is no heterodox innovation, but one which but fulfils natural and therefore normal bodily requirements.

Several sprue cases, by the advice of the writer, have returned to the Tropics and follow the fast day *régime*. One day in the week the usual diet of meat, vegetables, fruit, &c., is given up, and the patient takes nothing but milk for twenty-four hours. In this way several persons for whom life in a warm climate would have been otherwise impossible, are to-day enjoying good health. One usually allots Sunday as the milk day, but there is no reason why the "fast" day from meat should not be Friday, as it used to be with us, and is still in Catholic countries. Whichever day is chosen, however, is a matter of domestic convenience, but the omission, in cases of sprue, is apt to lead to recurrence of the ailment.

Sea-water for Rectal Injections.

The writer finds that of all forms of lavage for the bowel sea-water is the best. In chronic dysentery, in mucous colitis, in ulcerative colitis and even in sprue injections of sea water—a couple of pints filtered, warmed, but not diluted—are highly beneficial. The injections may be given daily for three days, but afterwards every third day or once a week, until all mucous or fermentation is removed. The same good is not obtainable by "sea-salt" dissolved in water, although sea salt thus used is perhaps better than any other of the vegetable decoctions or mineral solutions in common use.

II. — Sigmoido-Rectal Stricture — A Sigmoido-Rectal Pylorus—The Use of the Sigmoidoscope.

The writer has during recent years made it a rule to examine the rectum of all cases of intestinal flux. To merely call it rectal examination is misleading, for, as a rule, the rectum by digital examination or by the ordinary rectal speculum will be found normal. The trouble in three-fourths of cases of chronic diarrhœa, dysentery, mucous colitis will be found at the junction of the sigmoid flexure and rectum six to eight inches up, that is, eight inches from the anus anatomically owing to rectal curves, but only six inches when straightened by the sigmoidoscope. At this point, there is naturally a narrowing of the bowel, even a pylorus with some of the functions of the gastro-duodenal pylorus. We are accustomed to think of *the* pylorus as if in some way the name meant an anatomical attribute of the stomach, but the word pylorus has no such signification. Pylorus is derived from the Greek words πυλη = gate and ουρος = guard—a guard of the gate; the gate may be at the stomach, or sigmoid, or anywhere else. Therefore, to term the narrow junction of the sigmoid and rectum the sigmoido-rectal pylorus is no misnomer. The anatomy and physiology of this sigmoido-rectal pylorus, moreover, resembles in many ways the gastro-duodenal pylorus, a point which the writer will deal with more fully in the near future. It is no mere narrowing, but a true guard of the gateway from the sigmoid to the rectum. In chronic dysentery and in cases of colitis, this point will be found tender to palpation from the surface of the abdomen, at a point on the left side almost corresponding with McBurney's point on the right side in cases of appendicitis. Examination of the bowel at this point by the sigmoidoscope will elicit tenderness, at times exquisite; the mere touching of the point with a piece of cotton wool in a holder introduced through the sigmoidoscope will, as a rule, cause the cotton wool to be blood-stained, and the introduction of a long tube, say an œsophageal tube, through the bowel at this part introduced along the sigmoidoscope, will show that it is painful, that there is initial resistance to the tube of a spasmodic character, and that the tube is firmly grasped when it has been passed through and away up to the upper end of the sigmoid flexure or lower part of descending colon.

Stricture at this part is a common lesion in chronic rectal troubles, and without going into the matter further in the present paper, it is a condition which the writer has come to recognise and to deal with in the treatment of many forms of intestinal flux. The treatment consists of dilatation of the stricture, practised with the same intent as in cases of stricture of the urethra, and followed by as beneficial results in the rectal as in the urethral lesions. The nature of the stricture and the attendant clinical features of these two mucous tracts resemble each other closely, and their cure is effected by similar manipulations. To attempt to cure a sigmoido-rectal stricture by the introduction of a long tube without the sigmoidoscope, is to ensure failure. The sigmoidoscope must be introduced as far as possible, that is until mechanical

resistance and pain prevent its further introduction, and with the instrument held in position the œsophageal tube is passed along the tube of the instrument and held firmly against the sigmoido-rectal pylorus until the initial spasm is overcome, when it will slide up in the higher part of the bowel, with some pain, perhaps, but with the knowledge that the first step has been made in the cure of a rectal trouble which may have been of long duration and of a serious nature.

"Archiv. für Schiffs und Trop. Hyg.," vol. x., No. 2.

MALARIAL IMMUNITY.

Plehn, A., from clinical experience gained in Cameroon, concludes that personal immunity in a malarial district can only be relative and never complete. Old European residents in malarial countries seemingly attain an immunity, which is not a true immunity, but a mere tolerance which is not absolute. Any condition which tends to lower resistance, such as fatigue, sudden change in temperature, chills, accidents, or illness from any cause is apt to be attended by a suddenly increased virulence of the parasite or the toxins it produces. Malaria would seem to be latent in most, if not all, residents in malarial districts, and any departure from the even tenour of climate or the daily routine of life would seem to render the latent malaria active.

Natives of the Cameroon district who have never had febrile attacks, who have no enlargement of spleen, nor any signs of illness, may have malarial parasites in their blood; others, again, have enlarged spleens and some anæmia, and yet are free from fever. Neither of these states, however, betoken immunity, for were these persons subjected to depressing influence such as confinement in prison, attacks of fever are almost certain to result. The relative immunity of many natives seems to be inborn, that is to say, the child acquired immunity during fœtal life by being exposed to the endotoxins in the maternal blood; and after birth, although attacked by malarial parasites, which find their way into the blood through mosquito bites, yet is the child provided to some degree by the parasite poison present in its blood at birth.

Dr. Plehn is of opinion that Europeans arriving in a malarial district of the tropics can be also rendered relatively immune by the exhibition of quinine as a prophylactic. The quantity should be not less than seven grains, and the dose should be taken every fifth day, or if a large dose is preferred seven grains on consecutive days, either the fourth and fifth or the fifth and sixth. Quinine should be taken during the whole period of residence in a malarial district, and continued for at least six months after arrival in a non-malarial country.

When a large dose of quinine, say fifteen grains every fifth day, fails to prevent fever, the patient should be sent for change to a healthy (non-malarial) climate, and quinine administered every fifth day in seven grain doses for six months.

"Comptes Rendus de la Société de Biologie," November, 1905.

"Anopheles algeriensis et Myzomyia hispaniola convoient le paludisme." By Edmond and Etienne Sergent.

Messrs. Sergent have discovered the presence of sporozoit forms of the malarial parasite in the salivary glands of specimens of *Anopheles algeriensis* and *Myzomyia hispaniola*. These two mosquitoes have therefore to be added to the list of species capable of conveying malaria in Algeria; they are, however, both "wild," and are rarely found in dwelling-houses.—J. E. N.

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THE

Journal of Tropical Medicine

SEPTEMBER 15, 1906.

THE BRITISH MEDICAL ASSOCIATION MEETING AT TORONTO, CANADA, AUGUST 21 TO 24, 1906.

SOME 2,000 medical men attended the meeting of the British Medical Association, which was held in the buildings of the University of Toronto.

The meeting was a success in every way, the papers and discussion were scientifically valuable, the social arrangements were quite perfect, and the excursions to neighbouring and distant places of interest were carefully planned and conducted.

The retiring President, Mr. George Cooper Franklin, of Leicester, England, gave an account of the work of the Association during his year of office, and introduced the new President, Dr. R. A. Reeve, Dean of the University of Toronto. The Mayor of Toronto, Prof. J. H. Cameron, Prof. Alexander McPhedran and Dr. G. A. Bingham, delivered addresses of welcome on behalf of the city of Toronto, the local reception Committee, and of the Canadian and Ontario Medical Associations respectively.

The President, Dr. Reeve, after pointing out the cosmopolitan character of medical study, reviewed the early history and development of the British Medical Association, and referred to the advancement of medicine during the last ten years. Amongst the important subjects dealt with and advanced during

that period, he mentioned: (1) The new ideas brought forward in regard to the mechanical and chemical processes accompanying digestion, especially in the stomach; (2) the necessity for pure milk in the rearing of infants; (3) the researches in physiology by Sir Victor Horsley; (4) the discovery that pneumonia was a septic disease; (5) the introduction of "vaccine" for diphtheria and typhoid fever; (6) the discovery of a specific microbe in cerebrospinal meningitis; (7) the full recognition of the fact that yellow fever and malaria were carried by mosquitoes; (8) the extraordinary advances in preventive medicine.

The address in medicine was delivered by Sir James Barr, M.D., F.R.C.P. He chose for his subject "The Circulation Viewed from the Periphery."

Of the many interesting items in this erudite paper the following are noticeable: (1) As under normal circumstances a sufficient quantity of blood cannot get through the arterioles to keep the enormous capillary bed full, the lateral pressure and the velocity in the capillaries are ever-varying quantities; the pressure variations ranged from 50 to 2,000 mm. of water. (2) The variations of velocity of the blood in the capillaries amounted to from about 0·5 to 25 mm. per second. (3) The effects of gravity in the capillary pressure is an increase usually less than one-half of the hydrostatic effect, nor is the increase uniform, varying enormously in different individuals, and in the same individual under different conditions. (4) The viscosity of the blood is normally about five times that of distilled water, and in many diseases it amounts to nine or ten times that of distilled water. In Asiatic cholera the viscosity is often so great that it will not pass through the capillaries. A rise in temperature lessens the viscosity; the presence of carbonic acid gas in the blood is associated with diminished velocity and increases the viscosity, and Watson and Denning state that the chief resistance to the flow is due to the viscosity, and occurs in the capillaries. There seems, however, no doubt that the resistance to the arterial flow, and consequently to the heart, is situated in the first instance in the arteriole and small arteries and governed by vasomotor nerves. Were there not some such "first line of defence," the blood would gravitate into the more dependent parts, the cooling surface would be enormous, the capillary velocity would be diminished, the blood would become surcharged with carbonic acid gas, and we would become cold-blooded animals. By vasomotor mechanism a large amount of the cardiac energy is stored up in the arteries as potential, and is converted into kinetic energy in the arterioles and capillaries. Sir James Barr further discussed: The interchange of material through the capillary walls; the arterioles and capillaries of the skin; the arterioles and capillaries of the splanchnic area; the capillaries of the liver, the arterioles and capillaries of the kidneys and of the muscles; the cerebral vessels; the coronary vessels; the pulmonary circulation; the veins; the pressure in the veins; the velocity in the veins; the arteries, arterial blood pressure, and the heart.

Sir Victor Horsley, F.R.C.S., F.R.S., in his address in Surgery, dealt with "The Technique of Operations on the Nervous System." Surgical treatment of brain affections are undertaken for palliative or curative purposes. As a palliative measure against optic neuritis, which is so common a symptom of intracranial disease, it would seem that blindness may be averted with something like certainty by opening the subdural space early, and preferably in the basal temporal region of the right side, assuming that no attempt is made to attack the disease itself. Curative surgical procedures depend (1) On the nature of the intracranial disease; (2) the loss or aberration of nerve function it causes; (3) whether if the lesion be wholly extirpated there will be a recovery from the disorder of function; (4) whether any loss which may have been present before operation will be made permanent by the necessary extirpation of particular regions of the brain.

On points like the last it is evident that we cannot give a satisfactory opinion until we know precisely, first, what parts of the central nervous system alone contain the representation of movements or the record of sensation, and consequently of what parts does destruction entail permanent loss of function. In other words, we require to learn from the cerebral physiologist under what circumstances and to what extent can we get *compensation* of function when various parts of the cerebrum and cerebellum are destroyed.

(1) *As regards the Cerebrum.*—Apparently from the clinical records we can generalise thus far, that special motor functions cannot be restored if the whole of their cortical representation be removed. The same thing is probably also true of the special senses, and certainly is true of the hemianopic representation of sight. Succinctly stated, this amounts to the generalisation that compensation is not possible after the destructiun of middle leval centres. The higher sensory representation and *a fortiori* the intellectual functions are, on the contrary, not permanently abrogated by the destruction of any one part of the cerebral hemisphere. The net conclusion, however, must be that as little injury as possible should be done, and no more removed than is absolutely necessary.

(2) *As regards the Cerebellum.*—This question of compensatory power is of notable scientific interest when studied in the cerebrum, which is so clearly an assemblage of different nerve centres (in fact we might almost say organs), but it is no less interesting in the study of a homogenous structure like the cerebellum, and has assumed a particular importance in the present subject because of Professor Frazier's proposal to extirpate the lateral lobe of the cerebellum in preference to pushing it aside by displacement for the purpose of reaching deep-seated tumours. My own experience is against such extirpations for convenience. In fact, I regard them as an unnecessary mutilation, though quite admitting that in the process of removing a large tumour in that region the cerebellum is considerably bruised when so pushed aside. I ought to add that although I have removed a considerable number of lateral recess cerebellar growths, I have never found it necessary to do more than compress the cerebellum aside.

Sir Victor Horsley then proceeded to describe "Con-

sideration of the Details of Operative Procedure," and referred to (*a*) Previous Preparation ; (*b*) Anæsthesia; (*c*) Maintenance of the Body Temperature; (*d*) Hæmorrhage from arteries, arterioles and capillaries, and from veins. The address was illustrated by many excellent drawings.

The address in obstetrics was delivered by W. S. A. Griffith, M.D., F.R.C.P., F.R.C.S., who chose for his subject, "The Teaching of Obstetrics."

Section of Medicine.

President: Sir Thomas Barlow, Bart.

Dr. Percy M. Dawson (Baltimore) opened a discussion on "Blood Pressure in Relation to Disease." He stated that the pulse pressure might be taken as an index of the systolic output of the heart.

Dr. G. A. Gibson (Edinburgh) dealt with "Clinical Methods of Investigating Blood Pressure." The various factors concerned in keeping up the blood pressure are: the initial pressure or energy of the heart, the peripheral resistance, especially that of the splanchnic area, the elasticity of the vessel, the amount of blood in circulation and the viscosity of the blood. Estimating blood pressure by so-called *tactus eruditus* was condemned, and could only be gauged by modern instruments of precision. Observations should always be made with the patient in the horizontal position, owing to the variations due to various positions; and the variability noticeable according to the time of day the observations were made, and the influence of food and occupation were also insisted upon.

Sir William H. Broadbent, Bart., (London) discussed "The Clinical and Therapeutical Indications of Morbid Blood Pressure," and stated that *tactus eruditus* was the ultimate means of investigation, and that the real place of the instrumental investigation was the education of the finger.

Professor T. Clifford Allbutt (Cambridge) read a paper on "The Relation of Blood Pressure to Arterial Sclerosis." Arterial sclerosis may be apportioned under three headings: (1) The toxic, in some of which it is increased, as in lead poisoning; in some diminished, as in syphilis: (2) Hyperpietic (prolonged high pressure), in which there is considerable arterial stress, the majority being subjects of granular kidney ; (3) Involutionarily, met with in senile degradation, and associated with trophic or mechanical causes. These various groups of causes might be combined.

Dr. J. Mackenzie (Burnley), Dr. J. Lindsay Steven (Glasgow), Professor Alexander McPhedran (Toronto), and Dr. G. W. McCaskey joined in the discussion.

Dr. A. Stengel (Philadelphia) read a paper entitled "Some Clinical Manifestations, Visceral and general, of Arterio-sclerosis." He stated he had found continuous fever, lasting over considerable periods of time, in arterio-sclerosis without any local lesion to account for it, such as myelitis or other infection, and regarded the fever as possibly due to the active disorganisation of the tissues of the vessel wall, on the analogy of ferment fever.

Prof. Russell H. Chittenden (Yale) opened the discussion on "Over-nutrition and Under-nutrition, with Special Reference to Proteid Metabolism." Five men were fed for periods of from six to nine months on an average daily metabolism of from 5·4 to 8·99 grammes of nitrogen, *i.e.*, 34 to 56 grammes of proteid per day. In three cases, individuals of different weight, the amount of nitrogen required was 0·1 0·93 and 0·102 grammes respectively per kilogramme of body weight, amounted to not more than half of the Voit standard. Prof. Chittenden was of opinion that 0·1 gramme of proteid capable of metabolism per kilogramme represented the minimum proteid requirement, but it would probably be advisable to adopt a standard somewhat above this figure, and to give from 50 to 60 grammes of absorbable proteid to a man of from 60 to 70 kilogrammes weight, *i.e.*, a reduction of about 50 per cent.

Prof. Halliburton (London) was of opinion that if we reduced the amount of proteid to the minimum necessary to subserve the repair of waste of the tissues we should be dangerously near the margin, and little would be left as a source of energy. Dr. Otto Folin (Mass) said, at present there were no data whereby to determine the amount of proteid necessary.

Dr. Robert Hutchison (London) remarked that it would be interesting to ascertain the opsonic index in persons taking a lessened nitrogenous diet, in regard to various diseases producing organisms, and the way in which such individuals passed through an acute illness.

Prof. L. Lapicque (Paris), Dr. C. B. Ramarao (Madras), Sir James Grant (Ottawa), and Sir Thomas Barlow (London), took part in the discussion.

Dr. L. F. Barker (Baltimore) read a paper on "Amino-acids and Metabolism," the study of these acids present in foods showed that a human being took about the same quantity of these bodies, whether fish, white meats, or butcher's meat were taken, and the chemist was by synthesis now preparing from these a series of substances called peptides, viz., dipeptides, tripeptides, and polypeptides.

Dr. W. B. Thistle (Toronto) read a paper on "The Treatment of Typhoid Fever." Purgatives were suggested being given throughout the illness, so as to insure increased elimination of the typhoid organisms and their toxins. Calomel and salol were advocated as being at once purgative and antiseptic in the treatment of the disease. Dr. W. Caldwell (Belfast) said that the mortality of cases of typhoid fever which suffered from constipation during the course of the fever was less than those in cases in which diarrhœa was the rule, and therefore he avoided purgatives. Dr. F. M'Crae (Baltimore) said that typhoid was a blood or general infection, not a local intestinal affection, and therefore he withheld purgatives as unscientific, and intestinal antiseptics as useless. Dr. W. H. Neilson (Wisconsin), Prof. McPhedran, Dr. Barker, and Dr. J. H. Hamilton (Ontario) also joined in the discussion.

Dr. F. J. Smith (London), in a paper entitled "The Treatment of Typhoid," favoured a more varied diet than the milk and beef tea treatment ordinarily followed. The dread of perforation from food was exaggerated; perforation and hæmorrhage in typhoid had other causes than dietary. Any digestible food that was neither hard nor sharp-edged might be given in place of milk, which favoured fermentation at times, and was apt to cause distention and tympanites. The height of the temperature did not

negative departure from the milk *regime*. In cases in which the patient was disinclined for food, water and fruit juice might be given freely.

Dr. McCallum (Ontario) pointed out that it was difficult to state what a solid diet meant, for what was solid in the mouth might be fluid in the intestine, and *vice versa*.

Dr. R. Hutchinson (London) believed that to the lactic acid contained in it was probably due the beneficial action of milk; the question of diet, therefore, was not altogether a mechanical one.

Dr. McCaskey regarded milk as an unsafe diet in typhoid, considering the large masses of casein one found in the intestine in consequence of taking milk.

Sir Thomas Barlow remarked on the craving for food many typhoid patients developed, and it was a question whether it was always wise to deny them a suitably varied diet. Scraped beef or meat or fish passed through a seive, were often well tolerated in typhoid, and seemed to cause no special intestinal trouble.

Dr. D. G. Spiller (Philadelphia) described a case of syringomyelia, reaching from the sacral region of the cord upwards along the medulla oblongata, the right side of the pons, the right cerebral peduncle, and as far as the right internal capsule (syringobulbia).

In reply to Dr. C. Meyers, Dr. Spiller stated that he believed the sensation of pain (which was present in this case) was conducted by Gowers' tract, and not by the lateral columns.

Dr. S. Flexner (New York) read a paper on "The Serum Treatment of Cerebro-spinal Meningitis," in which he stated that he had succeeded in isolating an organism showing constant features, to which was assigned the name *Diplococcus intracellularis*. Against this he had prepared an antitoxin, made from monkeys, and 1 c.cm. of this substance injected into the spinal canal of a monkey which had previously received a lethal dose of the organism, prevented death. The signs and symptoms of the disease could be produced in monkeys by repeated doses of the toxin. Dr. L. Steven (Glasgow) said an outbreak of cerebro-spinal meningitis prevailed in Glasgow in March, 1906, and it was now included among the notifiable infectious diseases. Dr. MacFarlane (Albany) believed the best form of treatment in cerebro-spinal meningitis to be repeated tapping of the spinal canal. He was of opinion that the disease gained access to human beings by way of the pharynx. Seeing that it was impossible to inject fluid into the spinal canal in sufficient quantity to find its way to the cerebral cavity, the limitation of experimental meningitis to the spinal canal was probably explained. Dr. J. J. Putnam (Boston) compared "certain modern philosophic doctrines with regard to their relationship to the therapeutics of psychasthenia."

Dr. G. Doch (Ann Arbour) dealt with "Paracentesis of the Pericardium," stating that the operation was always attended by danger, be the precautions what they may. Posture seemed to have to do with the success of the operation, as, by altering the posture could fluid be drawn off. The angle between the xiphoid cartilage and the seventh left costal cartilage seemed the spot best suited for tapping the pericardium. Dr. T. B. McConnell (Montreal) mentioned a case of accumulation of fluid in the pericardium, successfully treated by tapping, and subsequent incision and drainage. Sir Thomas Barlow stated that he favoured incision in preference to aspiration in pericardial effusion, and said that fluid and fibrin collected behind the heart.

Dr. H. A. M'Callum (London, Ontario) introduced the subject of Gastric Neurasthenia, which was discussed by Drs. Putnam, McPhedran, Walsh and Caldwell.

Dr. Campbell Myers (Toronto) advocated spinal treatment for cases of acute mental disease during the preinsane stage. In this contention he was supported by Dr. Putnam (Boston).

Surgery.

President; Sir Hector Cameron.

Mr. Sinclair White (Sheffield) opened the discussion on "The Surgical Treatment of Ascites Secondary to Vascular Cirrhosis of the Liver." He proceeded to show the advantage of this operation, and stated that absolute proof has been obtained that epiplopexy leads, in suitable cases, to a remarkable development of anastomosing vessels between omentum and liver.

Mr. G. Guy Turner (Newcastle-on-Tyne) took part in the discussion.

Mr. John Lynn Thomas (Cardiff) read a paper on "Enucleation of the Prostate." He stated that enucleation of the prostate should be undertaken as soon as the patient was compelled to face the risks of "catheter life." He stated that there were no pronounced advantages of the suprapubic over the perineal method of enucleation so far as the incidence of mortality was concerned, but that the suprapubic operation showed slight advantage in regard to more complete removal of the organ. In the discussion which followed, a decided preference was shown, on the part of American surgeons, for the perineal route.

Dr. G. E. Armstrong (Montreal) reported a case of "Successful Removal of the Spleen in a Case of Banti's Disease."

Dr. Dow (Regina, Sark) showed a case of plastic surgery of the hip joint (arthroplasty), which had been successfully performed by introducing a layer of fascia and fat between the end of the divided femur.

Dr. Ingersoll Olmsted (Hamilton, Canada) in a paper on "The Surgical Treatment of Ulcerative Colitis," referred to the advantages of appendicostomy and irrigation of the intestine through a catheter, introduced into the appendix, after the manner originated and practised by Dr. Weir, of New York.

In a discussion on "The Surgical Treatment of Duodenal Ulcer," Dr. W. J. Mayo (Rochester, Minn.) recommended gastrojejunostomy as the most advantageous operation in chronic cases. In acute cases with perforation, transverse suture of the ulcerated and perforated area with pelvic drainage is indicated, with gastrojejunostomy subsequently. The results of this operation are eminently successful; of 175 reported cases of chronic duodenal ulcer operated on, two deaths only occurred; of ten cases operated upon for acute

perforation, four died; and of three cases operated upon for repeated hæmorrhage one died.

Mr. G. C. Franklin (Leicester) joined in the discussion, and mentioned that when a duodenal ulcer perforated the signs and symptoms were intense agonising pain in the upper part of abdomen, with locally rigid muscles.

Dr. B. E. McKenzie (Toronto) stated that in "The Treatment of Congenital Club-Foot," tenotomy and simple mechanical appliances were preferable to the more heroic measures in fashion. The tenotomy ought to be performed not earlier than the twelfth month of infant life.

Mr. Harold Stiles (Edinburgh) stated that he practised tarsectomy extensively in cases of club-foot, and claimed that by this means better and more speedy results were attainable than by tenotomy and mechanical appliances.

Prof. W. G. McCallum (Baltimore) in a paper entitled "The Surgical Relations of the Parathyroid Glands," stated that the acute tetany which occasionally followed removal of the thyroid gland, was owing to the fact that the parathyroid bodies were removed at the same time. The bodies referred to were met with, as a rule, along the course of the inferior thyroid arteries, but their number and position varied. That their removal was apt to cause tetany had been proved in both animals and man, and their preservation ought to be looked to during the steps of the operation for removal of the thyroid, when possible. Sir Victor Horsley discussed the paper.

Mr. C. J. Bond (Leicester) read a paper on "The Treatment of Acute Septic Peritonitis," in which he stated: (1) It is most important to avoid all unnecessary injury to the endothelium. (2) The diaphragmatic portion of the peritoneum is of great importance in the absorption of fluids and in phagocytosis. (3) Phagocytosis and the protection afforded by the endothelial cells lining the peritoneum constituted the first line of defence in injuries and diseases of the abdominal cavity. (4) Destruction of the cells opens the way for infection to be diffused by vascular or lymph channels. (5) Perforation of gastric or duodenal ulcers, followed by extravasation of the visceral contents into the peritoneal cavity was not followed by a virulent infection, and if early operation was practised curative results might be confidently anticipated. (6) Irrigation should be freely practised after laparotomy when gastric or duodenal contents, fæces, pus, bile or urine were found in the peritoneal cavity. (7) Irrigation should be withheld when the exudation into the peritoneal cavity was of a (*a*) sticky fibrinous nature; (*b*) when phagocytosis was likely to be disturbed; (*c*) and when the flushing of the cavity was likely to cause diffusion of the infective material. (8) In cases of gangrene of the intestine, and in local abscesses free drainage is a necessity. Dr. W. Howitt (Guelph), Dr. Murphy (Chicago), Dr. W. J. Mayo (Rochester) and others, joined in the discussion.

Mr. Jenkins (London) read a paper on "The Causation of Congenital Dislocation of the Hip." He ascribed the condition to be due to arrest in the bony development of the superior portion of the acetabulum.

Mr. G. G. Turner (Newcastle-on-Tyne) read a communication on "Intestinal Obstruction in Association with the Vermiform Appendix."

Dr. Parkins (Toronto) showed a case of multiple tumours in both breasts of a female patient.

Mr. C. H. Whiteford (Plymouth) showed a method of retaining a rubber catheter after external urethrotomy by means of what he termed a perineal stop.

A SIMPLE PREVENTIVE AGAINST MALARIA.

A CIRCULAR, published in English, Singalese and Tamil, is being circulated by the Ceylon Agricultural Society in Ceylon, drawing attention to the use of a composite oil for anointing the body to prevent mosquito bites. The suggestion is made by E. E. Green, F.E.S., and M. Kelway Bamber, F.C.S.

The constituents of the fluid suggested are citronella, kerosine, and cocoanut oils, with a certain proportion of carbolic acid. As an alternative for cocoanut oil, vaseline can be employed, but is more expensive.

Citronella oil alone is too dear for general use, and its effect is evanescent. Kerosine oil is similarly fugitive, and has the additional objection of an unpleasant smell.

It was found by experiment that a mixture of the above ingredients in certain proportions completely disguised the objectionable odours of kerosine and cocoanut oils, and produced a limpid liquid, smelling only of citronella, with a far more lasting effect. The mixture of the more inexpensive oils so reduces the cost that it can be freely employed on a large scale, and such a mixture could be easily produced locally on a commercial scale at a reasonable cost. The great difficulty with coolies is to induce them to take any precautions; but we know that they are always ready to anoint themselves either with cocoanut oil or with citronella if they can get it; but the latter is generally beyond their means.

All employers of labour in feverish localities should insist upon their coolies taking the simple precautions here suggested.

Every evening, at dusk, small quantities of the mixture should be rubbed over the legs and arms, and any other exposed parts, including the face; the oil is quite free from any harmful or unpleasant effect on skin.

Report.

THE HEALTH OF THE BRITISH NAVY—REPORT FOR THE YEAR 1904.

THE recently issued statistical report of the health of the Navy for the year 1904 extends to 197 pages.

The invaliding ratio of the total force amounted to 22·7 per 1,000, a decrease of 7·28 in comparison with the average for the last seven years.

The death-rate was 4·45 per 1,000, a decrease of 1·01 per 1,000 on the average of seven years.

The death-rate from disease alone was 3·14 per 1,000.

GENERAL DISEASES AND NUMBER OF CASES.

H. = Home; E.I. = East Indies; M. = Mediterranean; S.A. = South Atlantic; C. = China; N.A. = North America; I.F. = Irregular Force; A. = Australia; P. = Pacific; C.G.H. = Cape of Good Hope.

	Cases	Deaths	Stations
Small-pox	12	0	H. 1; E.I. 2; C. 9
Cow-pox	248	0	
Chicken-pox	29	0	H. 11; S.A. 10
Measles	118	0	H. 93; E.I. 8; C. 3; M. 2; I.F. 12
Rubella	47	0	H. 30; E.I. 1; N.A. 7; M. 7; I.F. 2
Scarlet Fever	179	4	H. 169; N.A. 3; I.F. 2
Dengue	26	0	C. 25; N.A. 1
Typhus Fever	1	—	C. 1.
Influenza	1,586	1	H. 1,083; M. 311; S.A. 16; N.A. 11; P. 4; C. 37; A. 31; I.F. 93
Mumps	143	0	H. 53; C. 27; A. 48
Diphtheria	29	1	H. 23; M. 5; I.F. 1
Plague	1	—	E.I. 1
Cerebro-Spinal Fever ..	2	2	H. 1; C. 1
Simple Continued Fever	1,035	0	H. 54; E.I. 310; N.A. 11; S.A. 14; P. 5; M. 401; A. 3; C.G.H. 27; I.F. 84
Enteric Fever	276	39	H. 51; E.I. 6; N.A. 25; P. 3; M. 61; C. 49; C.G.H. 5; I.F. 17
Mediterranean Fever ..	430	9	H. 59; E.I. 1; N.A. 1; M. 333; C. 12; C.G.H. 1; I.F. 22
Dysentery	113	9	H. 10; E.I. 40; S.A. 4; P. 3; M. 16; C.G.H. 1; C. 36; I.F. 23
Yellow Fever	1	1	I.F. (Jamaica) 1
Malarial Fevers	693	5	H. 167; E.I. 122; N.A. 27; S.A. 115; P. 3; M. 45; C.G.H. 62; C. 105; I.F. 29
Septic Diseases	34	12	
Tubercle	456	64	H. 272; E.I. 1; N.A. 9; S.A. 8; P. 4; M. 75; C.G.H. 10; C. 39; H. 17; I.F. 21
Venereal Diseases ..	12,258	10	
Rheumatism	2,361	1	
Gout	150		
Malignant Growths ..	9	8	
Non-malignant Growths	153	—	
Diabetes	8	2	
Beri-beri	4	0	E.I. 3; C.G.H. 1

THE PROPORTIONS OF SICKNESS AND DEATHS IN THE SEVERAL STATIONS.

Station	Strength	Sickness per 1,000	Deaths per 1,000
Home	59,470	721·37	4·27
Mediterranean ..	19,590	686·57	4·38
North America and West Indies	2,910	914·77	3·78
South Atlantic ..	1,780	990·44	3·37
Pacific	1,290	704·65	3·87
Cape of Good Hope ..	2,270	904·4	5·28
East Indies	1,930	1,222·79	10·36
China	10,180	779·56	4·91
Australia	2,970	794·94	7·07
Irregular Force ..	8,180	862·22	3·42

The following papers appear in the report:—

I.—SOME FURTHER POINTS IN THE ETIOLOGY OF MEDITERRANEAN FEVER, WITH PARTICULAR REFERENCE TO THE GROWTH OF THE SPECIFIC ORGANISM OUTSIDE THE BODY.

By Fleet-Surgeon P. W. BASSETT-SMITH, R.N.
Royal Naval Hospital, Haslar.

Major Horrocks, R.A.M.C., proved conclusively that the *Micrococcus melitensis* escapes by means of the urine from patients suffering from the disease. The urine thus containing the m.m. might then convey the disease by fresh or sea water, clothing or soil.

A few observations on similar lines were carried out and incorporated in the Report on the Etiology of Mediterranean Fever in the Health of the Navy, 1901, but the organism employed was derived from artificially infected human urine, or had grown for some period in urine, which did not appear in any way to reduce its vitality.

The most noticeable facts were that in even moderately alkaline urine the growth seemed to thrive for a time, not dying out until it gave a very considerable alkalinity (in one, that of standard decinormal soda solution), and that the larger the quantity of urine in the test tube infected, the longer the growth retained its vitality, and, of course, the grosser the original infection the more abundant the growth.

Fleet-Surgeon Bassett Smith by a series of experiments investigated the viability of the *M. melitensis* in sterilised urine, in sea water, in tap water, in fabric which had been infected and slowly dried, and in artificially infected dust.

The results of vitality of the m.m. outside the body shows that the m.m. can retain its vitality for a long period:—

(1) In urine which has become markedly alkaline.

(2) In fabrics which have become contaminated by urine containing the m.m.

(3) In sea and tap water infected by urine.

(4) In soil that has been infected by urine, and that has dried naturally.

From the experiments one may gather that in any endemic region where the sanitation is bad, it is easy for the dispersion of the organism and possible infection of the healthy to take place, quite apart from any agency of insects as secondary hosts.

II.—FURTHER NOTES ON THE DISTRIBUTION OF MEDITERRANEAN FEVER IN THE FLEET, WITH REFERENCE TO ITS ETIOLOGY.

By Fleet-Surgeon P. W. BASSETT-SMITH, R.N.
Haslar Hospital.

"In continuation of the statistical reports of the occurrence of Mediterranean fever, made in the years 1901, 1902, and 1903, I have again for 1904 made an abstract of the results from the special forms which have been filled in, details of which are given below. The total number of cases thus furnished is 260, as against 302 for 1903."

"Of these 260 cases 19 were relapses, giving a total of 241 fresh ones; some instances of the fever which occurred on the station have undoubtedly not been

included, none of these, probably, having been admitted into the Malta hospital."

"The diagnosis was confirmed in every case by the "serum reaction" test, either at Malta by Staff-Surgeon Gilmour, or by myself at Haslar."

"The observations of this year tend more conclusively than before to indicate that though sporadic cases of Mediterranean Fever do probably occur at other ports of the Mediterranean, by far the most prolific centre of infection is Malta itself."

III.—On the Agglutination Reaction in Mediterranean Fever.

By Staff-Surgeon E. A. Shaw, R.N.

Time of its Appearance.—Agglutination reaction is manifest in blood taken from cases quite early in the disease, viz., from two to five days.

Amount of Dilution in which it is Obtainable.—In a dilution of 1 in 2, the blood of healthy people and of patients suffering from other diseases will nearly always give it, and a large proportion of them will show traces of it in a dilution of 1 in 10.

Duration of Agglutinating Power after Appearance.—Birt and Lamb found it in all cases examined up to two years after the attack. After two years it was, in 8 out of 14 cases examined, no more marked than in people who had not had this fever; they record one case in which, seven and a-half years after recovery, there was still a complete reaction in a 1 in 20 dilution.

The phenomenon of agglutination in Mediterranean Fever is, as a rule, very marked and unmistakeable. The appearance of little white clumps, aggregations of micrococci, in the mixed drop of the specific serum and emulsion is frequently visible to the naked eye, especially on comparison with the control, and for the mere determination of the presence of agglutination in a 1 in 30 dilution, often a good pocket lens is sufficient after a certain amount of experience has been gained. It is advisable, however, especially at first, to commence with the low power of the microscope, the $\frac{2}{3}$-inch objective, arranging a feeble illumination; if a strong illumination be used, the micrococci, which, it must be remembered are not stained, will be practically invisible in the glare. Without disturbing the relative positions of the Abbé condenser and the plane mirror as used with the $\frac{1}{12}$-inch objective, the desired reduction of illumination can be obtained by racking down the two from near the stage till the upper surface of the Abbé condenser is very nearly an inch away from the upper surface of the stage on which the slide rests. Then, first wiping off all moisture from the under surface of the slide, and examining first the control—this, if properly made, will be found to present a very fine, faintly granular, appearance, without any indication of clumps then proceeding to the lowest dilution of specific (Malta fever) serum and micrococci, the latter, if agglutination has taken place, will be found aggregated into big clumps, or into a fine network spreading throughout the drop, usually both appearances will be present in the drop; then the higher dilutions should be examined, and the highest one in which agglutination has taken place, noted. No cover slips are necessary for the examination with the $\frac{2}{3}$-inch objective, but if, at the end of a couple of hours, no sign of agglutination can be detected with the $\frac{2}{3}$-inch objective, a small cover slip should be placed on the control and on the lowest dilution, and comparison made with the $\frac{1}{6}$-inch objective; this will necessitate the approaching of the Abbé condenser to within about $\frac{1}{4}$-inch of the surface of the stage, more light being required with the higher power, but, as before, a feeble illumination is best. If now no trace of agglutination can be detected, the result of the examination should be recorded as negative. It is highly desirable that, for the purpose of comparing the results obtained by different observers, some common standard should be agreed to. As regards density of emulsion used, this ideal is very difficult of attainment, but as regards length of time allowed for agglutination to appear and power of microscope used, there should be no difficulty. In the last hundred cases I have examined, I have invariably found agglutination, if present, to manifest itself in less than one hour, and to be visible under the $\frac{2}{3}$-inch objective. This reaction is much more marked and definite than the corresponding one in typhoid fever.

IV.—Notes on the Treatment and Symptoms of Mediterranean Fever.

By Fleet-Surgeon D. J. McNabb, R.N.

Forty-two cases are brought under notice and discussed in these notes.

In the general management of these cases it was found that they assimilated ordinary solid food with benefit to themselves, irrespective of high temperature.

Numerous drugs were tried without any appreciable result, the only one appearing to be of benefit being cyllin.

This drug is a preparation of the Jeyes' Sanitary Compounds Company, and appears to be a coal tar derivative.

The preparation used was pure cyllin in palatinoids, each palatinoid containing 3 minims of the drug.

The course of treatment by cyllin was inaugurated by a purgative such as calomel, and the drug was given at the rate of two palatinoids thrice daily.

It is non-poisonous, and its administration was followed by no unpleasant results.

Of the 42 cases under consideration 10 had neither pyrexia nor symptoms. These were dismissed from the list, and the remaining 32 dealt with.

These 32 cases are divided into 24 which were not treated with cyllin, and 8 cases in which the drug was tried.

The average duration of the cases not treated worked out at 70·6 days, while that of the cases where the drug was used was 38·5 days.

V.—The Year's Work at the Laboratory, Royal Naval Hospital, Malta, for 1904.

By Staff-Surgeon R. T. Gilmour, R.N.

The Agglutination Test in Mediterranean Fever and Enteric.—Eighteen hundred and ninety-eight specimens of blood were tested for these diseases. The reaction is of great aid to diagnosis, but not infallible.

The agglutination reaction may be present as early as the first day of the disease in Mediterranean fever; can usually be obtained in the first week; but may be delayed indefinitely. Cases with the symptoms of this fever are met with which never react.

The reaction rarely appears before the middle of the second week in enteric; in this disease also it it may be delayed, or never present.

The following deductions may be drawn :—

(1) At the commencement of convalescence there is usually a considerable drop in the reaction.

(2) In cases which relapse the agglutination test remains high.

(3) The reaction usually intermits before its final disappearance.

(4) Cases may have a negative reaction for several months, then react again.

(5) Cases may react up to eighteen months.

(6) Cases may only react for a few months.

(7) The agglutination reaction usually ceases during the second year of convalescence.

VI.—Compressed Air Illness and its Treatment by the Inhalation of Oxygen.

By Fleet-Surgeon Edward Pain Mourilyan, M.B., R.N.

The symptoms with which workers in compressed air, men employed in caissons and divers, are affected vary much in severity, and may be divided into two groups :—

(1) Those due to mechanical pressure, such as pains in ears, frontal and maxillary sinuses, and in carious teeth, headache, rupture of membrana tympani. These supervene on exit from compressed air and usually subside in a short time.

(2) Those, much graver, which are due to the actual presence of gas in the blood-vessels and to gas-embolism—*i.e.*, pains in limbs (the so-called "Bends") and joints, headache and vertigo, and other cerebral symptoms, deafness, dyspnœa, circulatory disturbances and paralysis. The paralyses do not supervene directly upon exit from pressure, but occur after a latent period of varying duration.

Oxygen is an important remedy in the prophylaxis and treatment of gas-embolism. By its use—its inhalation under stationary pressure—decompression can be rendered innocuous.

Symptoms of illness having set in, it promotes the separation of the gas in the right heart and assists the circulation. Combined with recompression, its therapeutical action is effected in the highest degree.

VII.—"Caisson" Disease (Diver's Palsy.)

By Fleet-Surgeon J. L. Barrington, R.N.

Royal Naval Hospital, Haulbowline.

Remarks.—The explanation of the condition in Caisson disease, like many other diseases of the nervous system, is still very obscure, and though the interest of the disease is centred in its pathology, the most that can be said for the various theories brought forward is that they are very indefinite and inconclusive. In one case reported by Leydens, death taking place on the fifteenth day, foci of hæmorrhages and signs of acute myelitis were found in the thoracic cord. In a case of Schultze, death occurring in two and a-half months, a disseminated myelitis was found in the thoracic region. In these cases slight fissures and lacerations were also found, as also in a third fatal case examined on the third day. One theory put forward is that the effects are due to liberated bubbles of nitrogen which have been absorbed into the blood during the high pressure. A second is that the symptoms are due to the pressure driving the blood from the surface into the great vertebral area of veins, followed by a revulsive anæmia, which, if true, would explain the temporary nature of the lesion in a case recorded by Fleet-Surgeon Barrington. In a second case, recorded by the same observer, the rise of temperature and temporary leucocytosis rather points, on the other hand, to a secondary inflammatory condition, the suddenness of the symptoms excluding inflammation as a primary cause. The paralysis was purely motor; there was no alteration in the sensation of touch, pain, heat or cold; the only sensory phenomena were shooting pains in the extremities. Now, since the sensory tract lies more towards the centre of the cord, and seeing that the reflex arcs were intact, one might hazard that minute sparsely scattered hæmorrhages in some of the motor tracts were the explanation of the symptoms.

VIII.—Notes of a Case of Splenic Anæmia.

By Staff-Surgeon Oswald Rees, M.D., R.N.

Shortly, *the symptoms of this rare disease are* :—Insidious onset and a fatal termination. In the blood, diminished hæmoglobia, a moderate erythrocyte anæmia (3,000,000 to 4,000,000), deformities of shape and polychromatophilia in severe and late cases, rare erythroblasts, marked leucopenic anæmia—(1,500-4,000), constituent leucocytes not much altered, but myelocytes in advanced stages—the spleen enormously enlarged, whilst the other lymphatics are not involved—pressure symptoms due to the enlarged spleen, dyspnœa, palpitation, dyspepsia, hæmatemesis, and epistaxis.

As regards the position of this disease in the official "Nomenclature of Disease," it would seem to fall most naturally between idiopathic anæmia and leuchæmia.

IX.—Ningpo Varnish Disease.

By Staff-Surgeon P. Hamilton Boyden, M.D., R.N.

This disease is an affection of the skin, chiefly of those parts exposed to the air, of an erythematous or eczematous character, caused by contact with or from sitting in a confined space recently painted with Ningpo varnish.

There are two kinds of varnishes :—

(1) Fat or oil varnishes.

(2) Spirit varnishes.

Their manufacture requires much skill and knowledge of the proper mixing of the ingredients, and in knowing how long they should be kept to mature before use.

In an oil varnish, to which variety Ningpo varnish

belongs, linseed oil is generally used as a vehicle; but in Ningpo varnish wood oil obtained from the Tung tree, growing plentifully in Mid-China, is made use of. The first process in the manufacture is to take a quantity of copal, which is a gum exuding spontaneously from the stems of various trees belonging to the genera, *Hymenda*, *Guibourtia*, and *Trachylobium*, found growing in the East and West Indies, and other parts of the world. The copal is melted in a pot, with a quantity of boiled linseed oil, by the aid of heat, until the mixture is perfectly clear; more oil is added in small quantities, and the mixture further boiled until it becomes stringy. The pot is then taken off the fire, and when cooled down sufficiently turpentine is gradually added, stirring all the while until the whole is thoroughly mixed; it is then strained and put aside until ready for use.

A quantity of Ningpo varnish was analysed and found to contain fat, an oleo-resin, a variety of copal, and a volatile acid, which were separated in the following manner:—The varnish was first of all treated with hot absolute alcohol, and so extracted the fat; the residue was treated with ether, which extracted the oleo-resin, leaving behind the very insoluble copal.

The volatile acid distilled over with the oleo-resin, and was separated by shaking up with water and evaporating the ether. The acid was in very small quantity, colourless, and had an irritating effect upon the unbroken skin.

The question now came to be as to the source of the oleo-resin and the irritative volatile acid, and one's thoughts naturally turned to the order, *Anacardianæ*, to which the genus *Rhus* belongs.

Rhus toxicodendron is a well-known irritant vesicant, and has a place in the United States Pharmacopœia.

In parts of China and Japan, *Rhus vernicifero* flourishes, and is used in Japan for making the celebrated lacquer.

I have found this tree growing plentifully in the higher parts of the Yang-tze valley, and think there is very little doubt that the oleo-resin from this tree is the basis of Ningpo varnish.

The varnish tree is a small, dicœcious tree, 10 to 15 feet high, with smooth branches and leaves, the latter being pinnate, and consisting of from 11 to 15 shiny green leaflets, from 2 to 3 inches long, and of an oblong form, with a long taper point. The fruit consists of racemes of small round berries, from the seeds of which Japan wax is expressed.

The manner of collecting the resin is as follows:—Incisions are made in the stem, and are repeated every fourth day at successively higher parts of the tree.

The inspissated juice is scraped off with a flat iron tool, and when the tree has been thus tapped to the topmost branches it is felled. The log is cut into lengths, which are tied into faggots and steeped in water for two or three weeks, after which the bark is pierced, and the oozing resin collected in the same way as from the stem. The juice thus obtained is a tenacious fluid of a greyish brown colour. It is allowed to stand and settle, when a kind of skin forms on the surface, the better quality rising to the top, and the impurities falling to the bottom. This fluid is highly corrosive, causing vesication and even ulceration of the skin, without actual contact, although it should be noted that, as in the case of other vegetable poisons—*e.g.*, *primula obconica*, also indigenous in China—many people are quite insusceptible to its action. As a rule, women and children are the greatest sufferers. In my own person, I have tried inhalation and also painting the varnish on the thin skin of the forearm, without any irritative effect being produced.

The volatile acid mentioned above has been investigated by several Japanese scientists. It is named "Urushic acid," derived from "Urushu," the Japanese word for the lacquer tree. This acid under the action of a ferment (a nitrogenous body), which is present in the fresh juice, rapidly becomes converted into oxy-urushic acid, of which I made mention before when noting the darkening in colour on exposure to the air.

A peculiar feature in reference to the application of the varnish is that it is always put on in damp weather, as it sets much better, and gets a harder and smoother surface.

The symptoms of varnish poisoning rival those imputed to the upas tree (*Antiaris*) of Java. The hands, arms, face, and in some cases the whole body, become greatly swollen from simply carrying a branch of the tree, or handling the varnish, the swelling being accompanied by intolerable pain and inflammation, and sometimes ending in ulceration. The treatment consists in the repeated application of a solution of *plumbi acetas*, which seems to have an almost specific effect in subduing the inflammation. The distribution of the disease is no doubt a very limited one, but I think it is of some importance for Medical Officers of His Majesty's Fleet to recognise that such an affection, which may at times assume a severe type, exists.

The varnish, being such an excellent one, is largely used by merchant ships trading in the Far East, and it is quite within the bounds of probability that commanding officers might make use of it, for varnishing the woodwork of His Majesty's ships, without knowledge of its dangerous properties; and if such cases did occur, a medical officer might be much exercised as to the cause of the outbreak if he were not acquainted with the symptoms of the disease.

X.—Cases resembling a Case of Dermatitis Repens.

By Fleet-Surgeon P. B. Handyside, R.N.

XI.—The Radical Cure of Inguinal Hernia.

By Fleet-Surgeon Vidal G. Thorpe, R.N.

Correspondence.

To the Editors of the Journal of Tropical Medicine.

Sir,—In reference to Dr. Hamilton Wright's article in your issue of August 15th, entitled, "Beri-beri: A Restatement and Reply to Some Criticisms," I beg to state that I do not consider I have misunderstood

his working hypothesis of the disease. My impression was that his "acute beri-beri" included the whole period marked "d" in his graphic illustration, namely, that during which the poison was formed, and a slight further period during which this poison continued to act, the whole corresponding to "g" in his diagram.

The lesions in the stomach and duodenum I found in thirteen out of thirty-four cases up to August, 1904, and in other cases in 1904 and 1905, but though common they cannot be said to have been "pretty constant." These lesions were found in persons dead in various stages of the disease, but in others they were absent both in early stages and in late stages. The nature of superficial lesions of the gastric mucosa is always difficult to determine, and when, as in beri-beri, there are also present nerve and vascular changes due to nerve poisoning, these difficulties are much increased. On macroscopic and microscopic examination I found nothing incompatible with the hypothesis that these changes were themselves secondary.

At no time have I "enunciated the pathological conception that this lesion cannot be primary." I did consider that it was necessary to test Wright's hypothesis by showing whether the condition was primary on other than histological grounds, and I therefore paid particular attention to the period assumed by Wright to exist, namely, that during which a gastro-duodenitis existed and no nerve lesions had developed—the period marked "c" in his diagram. Dr. Wright gives no instances of his own observation in support of his view. He gives histories which at most show that the patients complained of epigastric distress before they noticed any symptoms referable to nerve changes. Histories from natives and through native interpreters are not sufficient verification.

It was to this period "c," the only one in which the evidence could be conclusive, that most of my enquiries were directed, and I fully recognised that it was not the whole of the period during which Dr. Wright considered that the poison was being formed. In my own observations I did not find any cases in which the symptoms described by Wright were present without evidence of co-existent nerve lesions.

My use of the term "neuritis" is allowed by Dr. Wright as an alternative for "residual paralysis" in the Table of Contents and on page 1 of the "Studies of the Institute of Medical Research," vol. ii., Part II.

The subject is an important one, and it is well to clear up misunderstandings. Dr. Wright thinks I should have included clinical histories in my observations, but I venture to suggest that it would have been better if he had placed less reliance on such histories. With many of Dr. Wright's views I am in complete accord, and I recognise fully the admirable work he has done towards the clear enunciation of the problems presented by this disease, but I failed to find any satisfactory confirmation of the primary nature of the lesions he describes.

Yours, &c.,

C. W. DANIELS

New Instruments.

EVANS AND WORMULL, 31, Stamford Street, S.E., Surgical Instrument Makers, have sent us a copy of their comprehensive catalogue, which is well worth the perusal of any medical man who is about to make any purchases.

WE understand that Mr. Henry Gowlland, optician, of Selsey, Chichester, has perfected a new $\frac{1}{12}$ in. object glass, oil immersion, which he guarantees to be entirely of British manufacture, but what is of more importance to our readers, is that no soft glass is used in the objective, and that it will stand any climate. The objective is beautifully finished, and the price is only 55s., which compares very favourably with the objectives of foreign manufacture of the same power, which are retailed in this country at £5 and upwards. Intending purchasers would do well to write for further particulars before purchasing elsewhere.

Notes and News.

THE Report in the *United Provinces Gazette* of Major Chaytor White, I.M.S., as Chief Plague Officer of the United Provinces for 1905, is replete with practical interest. During the year 1905, plague existed in more or less epidemic form throughout the provinces. In many districts it was very severe, particularly in Muttra, where 45,644 deaths were registered, almost all occurring in the earlier months of the year under review. Only one district returned no seizures or deaths, viz., Almora. The total number of seizures reported in 1905 were 334,679, while the deaths totalled 305,737. It will be observed from the following figures that the deaths have progressively doubled in each of the last three years: (1903), 80,729; (1904), 166,620; (1905), 305,737. In the first five months of the year the mortality was most serious, but a marked change for the better has occurred during the plague season of 1905-6, so that there is hope that the disease is slowly dying out. The mortality for the first six months of the year was 300,039, while only 5,698 deaths occurred from July 1, to December 31. The disease has been uniformly more severe in rural areas.

Every inducement is offered to the people to evacuate infected sites, but they have not availed themselves of the facilities of the "health camps" established by Government to the extent that might be desired, and on this account reliance has still to be placed on disinfection. Disinfection by acid perchloride of mercury is still carried out. Izal, which was under trial in 1904, has not proved itself more efficacious than acid perchloride of mercury, moreover, the extra cost is against its use. Since December "cyllin" is being tried under the orders of the Government, and from the reports since received on its efficacy it is expected that it will prove a more effective disinfectant than the acid perchloride of mercury. The

same objection is present that is urged by natives against the use of phenyl—its smell—to which they strongly object. Phenyl is also used to a considerable extent.

Six thousand four hundred and eleven inoculations were performed throughout the provinces during the year 1905. Of these in Bareilly alone there were performed 5,194, against 3,010 in the previous year; this heads the list for inoculations in the provinces.

Phenyl, though a comparatively weak bactericide, it must be noted is a much better insecticide than the other agents mentioned, and it is probably owing to this that it has so often been found useful, to an extent that was inexplicable before the rat-flea hypothesis was accepted.

The details as to the results of rat-killing are most instructive, and it is satisfactory to find that it has been found possible to carry out this procedure without exciting undue opposition. This year rat killing was carried out on a large scale throughout the provinces. Only seven districts viz., Almora, Dehra Dun, Garhwal Saharanpur, Etah, Farrukhabad, and Mainpuri did no rat-killing. In Dehra Dun one rat only was killed. In all 851,167 rats were killed in 41 out of 48 districts.

Bareilly heads the lists in the year under report, and in it alone were killed 215,106 in five months. Allahabad comes next to Bareilly, and killed 77,345, Badaun and Agra killed 66,241 and 57,711 rats respectively, and ran third and fourth in the provinces. Badaun is only a small town of 39,031 inhabitants, but Mr. U. P. Allen, the collector, undertook the experiment of killing wholesale the rats in the town. This he did most effectively, letting out the work to contractors. The sum of Rs. 2,750 was spent on this work in Badaun, and not a single case of plague has occurred since the work was begun last monsoon up to now (March, 1906). Mr. Campbell, Collector of Bareilly, was also most energetic, and destroyed more rats than any other district officer. Out of the Rs. 100,000 at the disposal of the Inspector-General of Civil Hospitals, a sum of Rs. 24,850 was allotted for rat killing and general plague preventive measures. It may be mentioned that the above figures practically only refer to the last four or five months of the year, so that the efforts of the district officers were very real. From the plague returns, which have been received up to and during March, 1906 (usually the worst month in the year), it appears that the measures adopted have done much good in reducing the mortality, and the people undoubtedly believe that the measures adopted against rats have effected this. "Wonder" rat traps were used in almost all the municipalities and are much better than any other kind. They were distributed free to the public. Rewards are given to catchers for each rat caught, at different rates—generally two pice a rat and one pice a mouse. The rat poison called "Common Sense" is used by some municipalities and is well reported upon, no accident having occurred by its use. Opinions were obtained from the heads of the Medical Departments of various provinces as to the efficacy of the "Common Sense Poison" and all agreed that this poison is by far the best. Danyz' virus was tried in many places, but the results were not satisfactory. Special tubes were got out from England and distributed, but the opinion generally expressed was adverse. It is rather depressing, however, to find that Major Chaytor White considers that in villages rat-killing to a practical extent is almost impossible.

Lord Kitchener wants the Army to have its jam without the Gregory's powder. In a speech at the first meeting of the Standing Committee on enteric fever, his lordship suggested that the labours of the members should be directed to making antityphoid inoculation less unpleasant to the subject of the operation, even if the period of immunity were thereby curtailed.

The speech gives evidence of personal study of the question, but whether obtained through the action of spontaneous disease, or by the artificial process of inoculation, it is to be feared that immunity can only be gained at the cost of more or less personal discomfort.

The Indian Plague returns for the week ending July 28th show 562 deaths, a considerable drop as compared with the previous week's figures, after allowing for belated returns which swelled that week's total. Nearly half the mortality, viz., 262 deaths, occurred in Bombay. Madras reports only 6, and Bengal only 15; the United Provinces, 16; the Punjab, 11; Eastern Bengal, 4; Central Provinces, 1; Central India, 2; and Mysore, 37. Burma runs Bombay close with 208 deaths.

The total number of plague cases in Rangoon, however, for July, has been the heaviest since the outbreak of the epidemic in February, 1906. There were during the month 706 cases and 650 deaths.

The Indian Committee on Enteric.—On conclusion of the Commander-in-Chief's address, the Enteric Committee proceeded with their deliberations. They have since carefully considered the question of enteric fever with reference to its prevalence amongst various classes of individuals and communities in India. Statistics and evidence from the Army Medical Reports, the Annual Reports of the Sanitary Commissioner and others from the year 1856 were placed before them. The various sources of infection—excreta, fabrics, food, drink, &c., were discussed, and lines of present prophylaxis and a campaign for future prevention laid down. In the matter of cantonment sanitation the Committee had the advantage of the presence of the Inspecting Officer of cantonments (Lieutenant-Colonel Thornhill), whose views on this matter were of great assistance. The subject of antityphoid inoculation was fully dealt with. It is hoped the decisions arrived at and the line of action laid down will have marked beneficial results, not only on the health of the Army, but also to the community at large. The Committee, after four full days' sitting, have adjourned till the middle of October, when reports on the practical working of the various resolutions will be examined, and the recommendations, if necessary, added to.—*Pioneer Mail*, August 10th.

A good deal of disappointment is felt in Rangoon at the action of the Special Committee on Waterworks

in accepting the "Hlawga Scheme" in its present form. Instead of 40 gallons per head for a population of 650,000, at a total cost of about a quarter of a million sterling, the work actually accomplished can provide only 25 gallons per head for 207,000, and has cost over a third more than that sum; while, to provide for a population of 340,000 would cost twice as much as the original estimate, for nearly double the population. It is satisfactory, however, to find that all shades of public opinion appear to agree that a good and sufficient water supply is an absolute necessity to the town.

We reproduce from the August number of *The Indian Medical Gazette*, a letter to its Editor from Dr. E. S. Goodhue, which is of interest to all students of tropical medicine:—

THE BACILLUS LEPRÆ IN THE GNAT AND BED-BUG.

To the Editor of *The Indian Medical Gazette*.

DEAR SIR,—You will be glad to learn that Dr. W. J. Goodhue, Medical Superintendent of the Leper Settlement at Molokai, after several years of investigation there, has been able to demonstrate the *B. lepræ* of Hansen in the mosquito and in the bed-bug.

I will quote from Dr. Goodhue's official (but as yet private) report to the Hawaian Board of Health:—

"February 10th, 1906: We have since . . . . been sectioning mosquitoes taken from various leper houses, but until last June without any apparent success. At that time it appeared that we had isolated bacilli in these series of experiments, but, owing to the technique employed, it was impossible to confirm this . . . . This method of research was abandoned. . . . After repeated failures and the constant re-examination of fresh specimens, success has come as far as demonstrating the *B. lepræ* in the female mosquito (*Culex pungens*). . . .

"February 20th 1906: Since writing you I have discovered the bacillus of Hansen in the bed-bug (*Cimex lectularia*). . . . I believe that the *Cimex* is more of a factor in the spread of leprosy *among the natives* than the gnat" (here follow reasons).

Full reports of the work, with microphotographs of slides, &c., will be given publicity in May. You will kindly keep the matter confidential until May 8th, when you will be free to use it. We should be glad to have your Journal containing notices of the discovery.

Yours very truly,

Hawaii. E. S. GOODHUE,
April 9th, 1906. *Government Physician.*

That the agency of parasites should explain the mystery of the method of transmission of leprosy becomes increasingly probable, as parallel cases continue to be proven in etiology of other diseases. Our knowledge of the facility of accidental and intentional inoculation in the case of many diseases, makes it almost inconceivable that biting parasites should not, at least occasionally, act as inoculators; but in the case of leprosy, the failure of all attempts to produce direct infection makes it probable that some special parasite must be concerned, within which the virulence of the bacillus, as found in the human tissues, is enhanced.

In an Editorial our contemporary ably discusses Mr. Jonathan Hutchinson's recent book on "Leprosy and Fish-Eating." That the fish causation theory should be rejected by anyone with an extended acquaintance of Indian facts relating to leprosy is a foregone conclusion, as it is impossible to practice long in the country without meeting with lepers who, it is morally certain, would die at the stake rather than touch fish in any form, whether salted or fresh, newly caught, or in any stage of decomposition. In India, as elsewhere, leprosy is specially a disease of the verminous poor, but it is certainly no respecter of caste; though the peculiar dietetic limitations that are imposed by the caste system, and the rigidity with which they are carried out, should make India the best of all fields for the investigation of any food causation theory. Many castes will not touch fish, while others consume it largely; and the fact that leprosy is not practically confined to, or even specially common in the latter, is a sufficient demonstration that the theory in question is no better than an improbable fad.

On the other hand, the writer evidently considers that the last has not been heard of Capt. Rost's scarcity of salt theory, as he concludes his remarks with the following paragraph:—

We have no intention of bringing forward, without proof, a salt hypothesis, as opposed to a fish hypothesis, and as being the last word on the leprosy question. It is, of course, as readers of *The Indian Medical Gazette* are aware, not a new one, and we hope shortly to be able to test it in certain directions which we believe have never been attempted—a matter which is of some interest, as we understand that it is quite impossible to consider the Kasauli tests as final.

Personal Notes.

INDIAN MEDICAL SERVICES.

Arrivals Reported in London.—Major B. C. Oldham, Major H. St. J. Fraser.

Extensions of Leave.—Captain H. Hugo, D.S.O., furlough to December 12th, 1906; Major J. Chaytor White, 6 w., medical certificate; Major J. K. Close, study leave, May 1st to July 31st, 1906; Captain E. L. Perry, study leave, February 1st to March 31st, and May 1st to June 26th, 1906; Lieutenant-Colonel W. B. Browning, C.I.E., 1 m. 14 d., medical certificate; Major A. R. O. Russell, 6 m., medical certificate; Captain A. E. J. Lister, 1 m., medical certificate; Lieutenant J. W. H. Babington, 14 d.

Permitted to Return to Duty.—Major H. E. Drake-Brockman, Lieutenant J. W. H. Babington, Major L. F. Childe, Captain J. B. Christian, Captain R. L. Hagger, Captain R. D. Willcocks, Lieutenant-Colonel W. Coates, Major S. H. Henderson, Lieutenant-Colonel H. Fooks, Captain A. B. Fry.

Retirements.

Lieutenant-Colonel D. Prain and Lieutenant-Colonel Mawson are permitted to retire.

Promotion.

Captain Ross Pearce, M.B., to be Major.

Postings.

Captains F. A. Barnado and L. Cook, services lent to Government of Bengal.

Captains H. B. Steen, O. Moses and H. A. J. Gidney, services lent to the Government, East Bengal and Assam.

Captain W. S. Patton, services temporarily lent to Government, Madras; and of Captain Stewart and Lieutenant Proctor, for service on a Drainage Committee.

Captain M. Dick acts as Health Officer, Rangoon.

Lieutenant-Colonel J. Carmichael, R.A.M.C., to the Command of the Station Hospital, Jullundur.

Captain D. S. A. O'Keefe, to Medical Charge, 26th Punjabis.

Captain R. G. Easton, to Medical Charge, 22nd Punjabis.
Captain N. W. Jeendine, to Medical Charge, 27th Punjabis.
Captain T. C. McC. Young, to Medical Charge, 34th Sikh Pioneers.
Captain E. A. Walker, to Medical Charge, 36th Sikhs.
Captain J. Woods, to Medical Charge, 53rd Sikhs.
The undermentioned officers of the Indian Medical Service are appointed specialists in the subjects noted:—Fevers: Major Wimberley, 3rd (Lahore) Division. Prevention of Disease: Lieutenants Proctor, Umballa, and Ingram Aden. Captain Keys is appointed specialist in Midwifery and Diseases of Women and Children in the Western Command.
The undermentioned officers of the Royal Army Medical Corps are permitted to continue in their appointments of specialists in the subjects noted:—Fevers: Major Clark, 1st (Peshawar) Division; Captain Huddleston, 5th (Mhow) Division; and Captain Hopkins, 6th (Poona) Division. Skiagraphy: Major Boyle, Burma Division; and Captain Grech, 7th (Meerut) Division. Dentistry: Lieutenant Bowle, 5th (Mhow) Division. Ophthalmology: Major McDermott, Eastern Command; and Captain Kiddle, Western Command.
The undermentioned officers of the Royal Army Medical Corps, on return from leave, are appointed specialists in the subjects noted:—Operative Surgery: Major Cameron, 3rd (Lahore) Division. Midwifery and Diseases of Women and Children: Captain Maurice, Eastern Command. Laryngology: Captain Profeit, Northern Command. Otology: Captain Berne, Western Command.
Military Assistant-Surgeon C. A. Owen, M.D., I.S.M.D., officiates as Civil Surgeon, Shahpur.
Captain J. Stephenson, to be Civil Surgeon, Umballa.
Captain C. A. Lane, to be Civil Surgeon, Purnea.
Major Brend, to be Inspector-General, Prisons, Punjab, in succession to Major Macnamara, who is transferred to Madras, in the same capacity.
Captain W. C. H. Forster is placed on special duty under the Sanitary Commissioner with Government of India.
Major O'Kinealy acts as Professor of Ophthalmic Surgery, Calcutta.
Captain S. L. Marjoribanks, to be Deputy Sanitary Commissioner, Western Registration District.
Captain F. H. G. Hutchinson, to be Deputy Sanitary Commissioner, Southern Registration District.
Captain R. W. Antony, to be Civil Surgeon, Ratnagiri.
Major L. Rogers, Major D. M. Moir and Dr. Annandale are appointed Fellows of the Calcutta University.
Captain E. Bisset assumes charge of civil medical duties of the Kohat District.
Lieutenant W. Tarr assumes Civil Medical Charge of Sheih Budin.
Captain W. H. Cazaly, to be Civil Surgeon, Satara.
Captain A. G. Sargent, to be Civil Surgeon, Panch Mahals.

Leave.

Major B. Oldham, combined leave, 15 m.
Major Maynard, Professor of Ophthalmology, Calcutta, privilege leave, 3 m.
Captain W. C. Ross, Deputy Sanitary Commissioner, Oussa Carch, privilege leave, 2 m, 23 d.
Captain C. J. Robertson Milne, services replaced at disposal, Government of Bengal.
Captain W. S. J. Shaw, services temporarily lent to Government of Punjab.
Captain C. A. Gourlay, services placed permanently at disposal, Government, East Bengal and Assam, in Sanitary Department.
Captain F. Wall, 62nd Punjabis, to additional civil charge of Fyzabad District.

Colonial Civil Service.

Dr. A. Morrison has retired from the office of Government Botanist of Western Australia.
The Hon. Dr. F. Watts, C.M.G., Government Chemist and Superintendent of Agriculture, Leeward Island, has left the Colony on leave for four months, during which Mr. H. Tempany will perform his duties.

PLAGUE.

Prevalence of the Disease.

			Cases.	Deaths.
India.—Week ended	August	4th	—	738
,,	,,	11th	—	936
Mauritius ,,	,,	8th	1	1
,,	,,	15th	3	2
,,	,,	22nd	6	4
,,	,,	29th	13	13
,,	September	6th		
Hong Kong.—Week ended	Aug.	19th	3	2

Clean Bills of Health issued for Hong Kong on August 29th.
Australia.—During the week ended July 21st, 1 case of plague at Cairus, Queensland. No other cases of plague reported from July 7th to August 4th in any part of Australia.
South Africa.—No cases of plague from July 7th to August 18th.

THE SLEEPING SICKNESS.

King Leopold and the Liverpool School of Tropical Medicine.

In view of the alarming nature of the recent reports with regard to the spread of sleeping sickness in Africa, and of the fact that an expedition organised by the Liverpool School of Tropical Medicine has been studying this disease for three years in the Congo, Sir Alfred Jones, president of the school, requested an audience of the King of the Belgians in order to confer with him upon the subject. In a recent letter to the secretaries of the reform committee King Leopold referred to his deep interest in this matter, and, besides offering a prize of 200,000f. (£8,000) for the person who should discover a remedy, he has placed a credit of 300,000f. (£12,000) in the Congo estimates for the purpose of prophylactic research.
The committee of the School were received at the Palace, on August 23rd, at noon. The representatives present included the president, Sir Alfred Jones, Professor Ronald Ross, C.B., F.R.S., Professor Boyce, F.R.S., Dr. J. W. W. Stephens, Dr. J. L. Todd, Mr. R. Newstead, Dr. Evans, and Mr. A. H. Milne. The King gave a most attentive hearing to the views of the experts of the school on the necessity of preventing the further spread of sleeping sickness. He agreed with Sir A. Jones that the question was one of international importance, and said that, as far as he was concerned, he was prepared to do all in his power to relieve both the white and black population from the terrible dread of this scourge. His Majesty asked the Liverpool School to submit to him a scheme for the prevention of the disease, and this request will be acted upon as soon as possible. He has promised his co-operation if it is in any way feasible or practical. The King expressed in high terms his appreciation of the energetic work now being carried on by the school and of the thorough manner in which its expeditions are worked. In conclusion, to show the value he placed upon that work, he bestowed the Order of

Leopold upon Professor Ross, Professor Boyce, and Dr. J. L. Todd, the last-named of whom worked on trypanosomiasis in the Congo Free State for three years.

The conference was followed by a luncheon at the Palace to the representatives of the Liverpool School. Among those present were Baron Wahis, Governor-General of the Congo, Commandant Liebrechts, Secretary-General of the Home Department, and other leading representatives of the Brussels Administration.—*Times*, August 24th, 1906.

UNIVERSITY OF CAMBRIDGE.

Diploma of Tropical Medicine and Hygiene. D.T.M. and H. (Camb.)

The following candidates qualified for the Diploma during the year, 1906:—February, 1906—J. Booth-Clarkson, J. C. S. McDowell, R. Small; August, 1906—Samuel Anderson, Robert Thomas Booth, Charles Walter Holden, Thomas Campion Lauder, Harry Strickland McGill, Edward McKillop Nicholl, Ambrose Thomas Stanton, Lessel Philip Stephen, Edmund Wilkinson, Andrew Watson Cook Young.

Examiners { George H. F. Nuttall. Ronald Ross. C. W. Daniels.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the Journal of Tropical Medicine *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Proceedings of the Royal Society," vol. lxxviii., No. B. 522.

"The Microscopic Changes in the Nervous System in a case of Chronic Dourine. Comparison with those found in Sleeping Sickness."

Mott, F. W., M.D., F.R.S., states the result of an investigation in the nervous tissues of an Arab stallion which acquired Dourine or *mal de coit*, by infective coitus. The tissues were forwarded by Dr. Lingard of the Imperial Bacteriologist Laboratory of India. The result of the investigation demonstrated that in Dourine, in animals inoculated with *Trypanosoma gambiense* and in human sleeping sickness, chronic trypanosome infection sets up a lymphadenitis and a chronic inflammation of the lymphatics of the central nervous system. As the result of these inflammatory states, a chronic interstitial condition of the lymphatics of the soft membranes, the subpial septa and the perivascular spaces, without any pronounced destruction of the neural elements. Of this chronic interstitial change the cell proliferation of the neuroglia is the primary evidence; and it is surmised, from the knowledge attained by observing chronic trypanosomiasis in animals, that the lymphocyte accumulation and proliferation is of a secondary character and in part the result of the changes referred to in the neuroglia.

In view of the fact that Dourine is caused by a specific form of trypanosome conveyed during coitus in the horse, Schaudinn's demonstration of the spirochætæ pallida in syphilis is daily acquiring increased significance and interest. Dourine may be shortly described in the light of recent knowledge as "Horse Syphilis."

"Indian Medical Gazette," June, 1906.

(1) Splenic Abscess in Malarial Fever.

Anderson, A. R. S., Major I. M. S., describes two cases of splenic abscess in Hindu male prisoners in Port Blair Gaol, Andaman Islands. In both cases there had been a long previous history of malarial fever and enlarged spleen. In one case no malarial parasites were found, probably owing to quinine administration; in the other case malignant tertian parasites were found. A slough was found in one case; in the other no ponderable slough, but a quantity of broken-down splenic tissue. Of 77,949 patients suffering from malarial fever, seen by Major Anderson during the past five years, these are the only two cases in which splenic abscesses were diagnosed. In three other spleens, out of a total of 178 fatal cases reported upon, splenic abscesses, or the condition possibly precedent to such abscesses, were found. In one spleen were several hæmorrhagic infarcts; in a second numerous miliary abscesses; and in the third several small abscesses.

Of the two cases operated upon by Major Anderson, one recovered and was well five years afterwards, the other survived the operation nine months, subsequently dying from pyæmia.

(2) "Cysticercus Cellulosæ of Tongue, with a Note on the Helminthology of one of the Madras Jails."

Williams, C. L., Major, I.M.S., found a cystic swelling about the size of a hazel nut in the under-surface of the left side of the tip of the tongue of a convict in the jail at Coimbatore, Madras Presidency, India. From the swelling when cut down upon, the head of a Tœnia Solium was enucleated. The district of Coimbatore seems to be in distinct contrast to the reported prevalent infection of the alimentary canal of the natives of India generally, for, as a rule, the natives of Coimbatore are wonderfully free from "worms."

"Ann. de l'Inst. Pasteur," May, 1906.

Antidysenteric Serum.

Vaillard and Dopter found that the serum from horses which have been immunised against the dysentery bacillus is applicable and useful in dysentery in man. The prepared horse serum has anti-bacterial and anti-toxic properties, and when injected in doses proportionate to the severity of the dysenteric attack remedial effects speedily result. The injection should be given early in the disease, but even as late as the sixteenth day in acute dysentery the treatment is efficient.

"Riv. Crit. di Clin. Med.," 1906.

Splenocleisis.

Schiassi, B., in a case of enlarged spleen and marked anæmia, cut down on the spleen, scraped the surface with a sharp spoon, enveloped the spleen in five layers of gauze and sewed the wound up, leaving, however, the ends of the strips of gauze protruding from the upper and lower ends of the wound. The strips were removed one by one from the fifth to the ninth day after operation. The patient did well, the blood count rose in six months (that is from before until after operation) from 3¼ to 5½ million red cells, hæmoglobin from 24 per cent. to 92, and white cells from 1,600 to 6,200. In true splenic anæmia the only signs and symptoms are enlargement of the spleen and anæmia, both of which tend to increase. The success of this operation is encouraging.

Notices to Correspondents.

1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the Journal of Tropical Medicine should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communications.

NILE BOILS.

By Frank Cole Madden, M.D.Melb., F.R.C.S.Eng.

Professor of Surgery, Egyptian Government School of Medicine; Senior Surgeon, Kasr-el-Ainy Hospital, Cairo.

During the hot months, and particularly in the damp weather towards the end of the summer, and also at the changes of season, residents of Egypt frequently suffer from a peculiarly painful boil (or boils), which has so many distinctive features as to justify a more detailed description than has hitherto, so far as I am aware, been devoted to it.

The European residents are probably more often attacked than the native Egyptians, though the latter are not by any means exempt. In their case, however, the condition about to be described is included with many other pustular lesions, due to the heat and excessive sweating, in the all-embracing title of "Hamm en-Nil," which, to the native mind, is sufficiently comprehensive to connote any skin eruption from a prickly heat to a general furunculosis. Though thus almost lost sight of among its many distant relatives, true Nile boil does occasionally occur.

A form of boil, the so-called "Bouton de Nil," next of kin to the Delhi boil, the Aleppo boil, and the Biskra button, as described by Manson, Briault, and other observers, is essentially a chronic process, and in my eight years' experience in Egypt I have never met with such a condition, either in hospital or private practice. The boil we are accustomed to call the Nile boil is an acute inflammatory and exceedingly painful condition, which does not last more than fourteen days from beginning to end.

As has already been mentioned, the boil is particularly frequent at the end of the summer, when the Nile is rising or is in flood, and the weather is very damp, and also in the early spring, that is to say, at the end of the cold season. In certain cases it occurs when the patient is much "run down," or after one of the infectious fevers, but is just as frequently met with when he is in the rudest health. Food, drink, or water do not seem to influence its occurrence, and no *régime* or diet appears to prevent it. One is liable to have attacks of boils at long intervals, sometimes every summer, or to have a series of boils one after the other, which persist for a long time. The boils also have an unfortunate habit of developing in particularly tender places, some of their favourite seats being the perinæum, especially all round the anus, the buttocks, the arms, the hands and the fingers, and the face. They are not so common on the neck or on the lower extremities below the buttocks, though they are to be found on any part of the skin surface, and even within the external auditory meatus. They are more common in men than in women, but are no respecters of age or sex, though, fortunately, they do not often occur in young children.

Having been myself the subject of Nile boils on no less than four occasions, I can speak with some authority on the matter, and cannot do better than describe my feelings in detail, reinforcing my own personal reminiscences with certain additional facts I have observed in other fellow-sufferers.

On accidentally rubbing my forearm with my cuff, I felt a distinctly painful point which, on close examination, I found to be a minute red spot at the base of a hair, in the hair follicle. In a few hours' time the redness was more evident and the spot was slightly raised around the base of the hair; the tenderness, even at this stage, was altogether out of all proportion to the naked eye appearances, the least friction of the shirt sleeves being quite painful. During the night I was conscious of a transient throbbing in the spot and found myself taking unusual care to place the arm in a comfortable position.

In the morning there was a red swelling the size of a sixpence, not unlike an ordinary blind boil, which was very painful, throbbed horribly, and was acutely tender to the least touch. The skin around the hair was dusky and was surrounded by a zone of dark red inflammation, fading off to a hyperæmic redness beyond. The central portion of the swollen lump was very hard and indurated, the indurated piece feeling as though it were let into the deeper parts of the skin. By mid-day the lump had increased in size and was even more tender than before. The surrounding inflammation had also increased in proportion. Thin, tender, red lines of inflamed lymphatics could now be seen, and there was pain above the elbow and in the axilla. A tiny blister had formed in the centre of the boil and this burst on extracting the hair and exposed beneath it the top of a pea-green-coloured slough, which was firmly attached all round to the surrounding inflamed tissues. The colour and the characters of this slough is very typical and its appearance confirms the diagnosis.

From this time onwards the swelling generally increased until it reached the size of the palm of the hand, and it exhibited all degrees of acute inflammation with the green chamois leather-like slough in the centre. The hard induration was now the size of a florin and the whole of the inflamed area was œdematous and pitted on pressure. The point of acutest pain was immediately around the slough.

On the fourth day a drop of thick pus was squeezed out from beside the now much enlarged slough, but without any relief whatever. The slough was still firm all round, except just at the skin surface, and gave me the idea of being screwed into the bone in the depths of the boil. The lymphangitis and the pain in the axilla increased and the lymphatic glands were enlarged and tender. The arm was absolutely useless, felt as heavy as lead, throbbed violently on any sudden movement, and could not find a comfortable place for itself anywhere.

On the fifth day, by dint of hot fomentations, the slough, which was now more yellow in colour, looked looser, and a vigorous squeeze caused the greater part of it to pop out. It looked like a partially macerated bean, and was coated with thick pus. The remains of the slough still holding on tight to the depths of the boil, had to be picked out with dissecting forceps, and a small quantity of thick, slimy-looking pus was finally squeezed out. There was then left a crater-like cavity with sharply cut though rather eaten-out edges, in the midst of a still much inflamed and indurated area of

skin; but from the moment of the loosening and subsequent removal of the slough, the pain vanished as if by magic, and the part, though still hard and inflamed, was quite painless and could be handled and squeezed with impunity. Indeed, save for the redness and the crater it was difficult to believe that a short time before one was in such severe pain.

The next morning the cavity had filled in a great deal and a little sero-pus could be squeezed out; by evening it had nearly all filled with granulation tissue and was coated with a thin layer of coagulated serum.

In two days' time the sore had quite healed, the redness had markedly diminished, and a small hard lump was all that remained of the induration. A permanent scar, covered thinly with skin, remains, or a small mass of keloid forms in the scar. Throughout the whole period, up to the time of the expulsion of the slough, a very small quantity of serous discharge was found on the dressings. I have had two boils in adjoining follicles, which, starting on different days, made the whole course of the disease longer; but, though there is a larger scar from the fusion of the two craters, the symptoms were substantially as just described. Infection of neighbouring follicles naturally frequently results. When crops of boils occur, as is sometimes the case in the perinæum, on the loins or on the face, during the time of their acuteness, the local as well as the general symptoms may be so severe as to give rise to some anxiety. I felt perfectly well in myself when the boils broke out, but by the third day I felt distinctly "seedy," with all the usual accompaniments of fever, including a general malaise, loss of appetite, headache, sleeplessness, &c. In some cases when a large number of boils develop one after the other, the constitutional symptoms may be severe.

Professor Symmers made a culture directly from the slough, on the third day of the disease, and grew a pure culture of *Staphylococcus pyogenes aureus*. In severe cases a spreading cellulitis may supervene, or, more usually, an abscess form just beyond the limits of the boil, and, rarely, all the more serious septic consequences may ensue.

Treatment is most unsatisfactory. In the very early stage an attempt, which it must be admitted is very rarely successful, may be made to abort the boil by extracting the hair and injecting a drop or two of pure carbolic into the reddened follicle.

Once the boil has got beyond the initial stage the hair should be extracted and hot sublimate or lysol fomentations, or antiseptic linseed poultices, applied and changed as often as possible. These hot applications in my experience are the only measures that afford any relief. Each time they are changed the part should be soaked in water, as hot as can be borne, for ten minutes before the fomentation is re-applied.

It is not the least use trying to squeeze out the slough until it is loose. It will not come out and the squeezing only increases the pain and the throbbing. Sometimes it comes out of itself on the fomentations on the fifth day. Even after its removal the fomentations are best continued for another twelve hours, after which the part may be dressed with vaseline or boracic ointment. Splints and other appliances to immobilise the inflamed parts must be used as necessary, and all complications treated as they arise.

Little is usually required in the way of general treatment, except an efficient aperient in the earlier stages, a low diet, and rest. I have tried calcium sulphide, sulphur, sulphate of magnesia, and many other drugs without any good result, nor have I seen any effect from yeast in any form.

Once a boil has developed it is a good plan to pull out the surrounding hairs to prevent infection, but I know of no remedy of any service as a prophylactic.

I would, with all respect, venture to affirm that the condition, hitherto described as the Nile boil, or "Bouton de Nil," does not now exist in Egypt; but there is a particular form of boil peculiar to the country, characterised by the intensity of its inflammation, its extraordinary and early tenderness and pain, out of all proportion to its naked eye appearances, its characteristic slough and very scanty serous discharge, its rounded button of hard induration, and its resistance to treatment, until it has run its own course, which is a distinct pathological entity and a worthy successor to the title so long borne by its better-known predecessor.

THREE CASES OF INFECTION WITH *SCHISTOSOMA JAPONICUM* IN CHINESE SUBJECTS.

By O. T. Logan, M.D.

Medical Missionary, Changteh, Hunan, China.

I am led to contribute this paper for three reasons: (1) To help define the geographical distribution of the fluke. (2) To give an idea of the form of the egg and embryo as it is seen in the stool. It seems very unfortunate that none of the current numbers of this Journal nor the latest, and one might safely say the only, book in English on the subject of animal parasites in man, should have failed to give drawings of the ova or embryo that would enable one to recognise the presence of this fluke. (3) To show the effect of treatment.

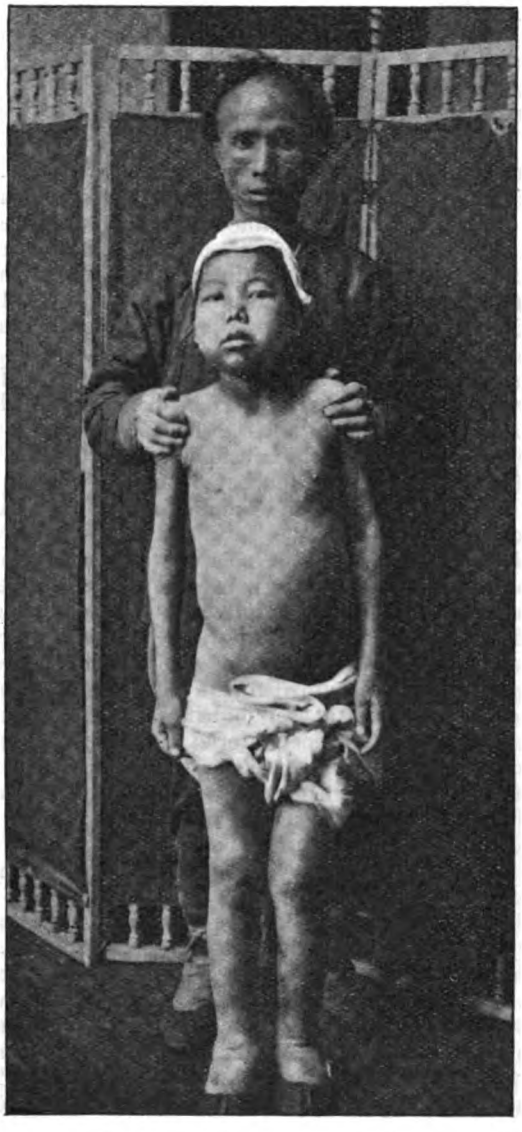
Our first case has been reported in full, at my request, by Dr. Beyer,[1] who, with Drs. Stiles and Lovering, identified and measured the eggs in the specimen of fæcal matter sent by the writer. They found the average measurement of nine eggs to be 72 microns in length and 48 microns in width. Thus it will be seen that the egg is only a little larger than that of the *Ascaris lumbricoides*—a very important matter for the novice in fæcal examination to note.

Our second case is especially instructive in that it shows the good effects of treatment, and offers hope that some of these patients may outlive the parasite and eventually be cured. The notes on this case are as follows:—

Tsen, male, aged 13. Born and reared in Hunan Province; Changteh Prefecture. Occupation, farmer. It should be stated that one of the duties of farmers,

[1] "A Second Case of Infection with the Asiatic Blood Fluke (*Schistosoma Japonicum*)," by H. G. Beyer, Medical Inspector, United States Navy. *American Medicine*, vol. x., No. 14, pp. 578-579, September 30th, 1905.

in this district at least, is to fish in the ponds that are always near the houses of the farmers. This means that there must be a good deal of wading, as the small seine is one of the commonest implements used in catching fish in these ponds, the banks of which are always strewn with snail shells, the former occupants of which, no doubt, are the intermediate host of the parasite. Patient also admitted that he often drank this water without boiling.



Schistosoma japonicum infection.

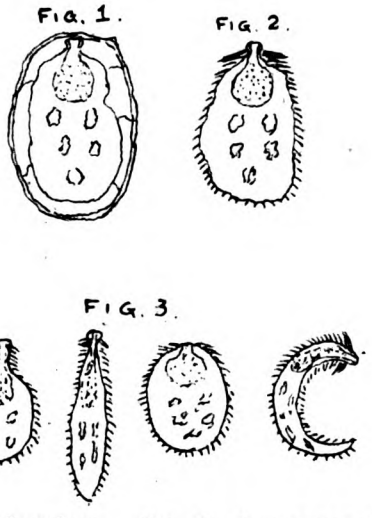
The boy gave a history of swelling of the legs and face about two years previous to admission to the hospital, and found that he could not do any considerable amount of work without great inconvenience on account of shortness of breath. Along with this he had bloody stools. At the time of admission he had, on an average, six of these stools in twenty-four hours, accompanied by prolapse of the rectum of some one and a half inches. His legs and face were swollen, and presented the appearance of a patient suffering from hook-worm infection. Spleen and liver not enlarged, as in our first case. The heart dulness was enlarged and the sounds muffled, except over the base, where there was a loud anæmic murmur. Conjunctiva and finger-nails were colourless.

The blood examination showed only 10 per cent. hæmoglobin. Differential count of the leucocytes showed:—

Polymorphonuclears	71	per cent.
Eosinophils	10	,,
Lymphocytes, small	11	,,
,, large	8	,,

Number counted, 112.

Poikilocytes and microcytes were numerous, with a fair number of megalocytes. No nucleated red cells were found.



Schistosoma japonicum. FIG. 1.—Appearance of egg as passed in fæces. Embryo inside. Cilia do not show on sharp focus. FIG. 2.—Embryo outside of egg, at rest. FIG. 3.—Shapes assumed by free embryo in recently voided fæces.

Patient entered hospital April 26th, 1906, and was at once given full doses of iron preparations, combined with strychnine and quinine, the latter in small doses. He improved rapidly, and on May 12th his conjunctiva was pink, and the hæmoglobin had increased to 35 per cent. The œdema of the legs and scrotum was still present, but the stools were only three a day, and the prolapse of the rectum was almost gone. There was no blood nor mucus apparent in the stool. Microscopic examination of the stool showed a few eggs of *Ankylostomum duodenale, Tricocephalus dispar*, and many of the ova of *Ascaris lumbricoides*; no eggs of the fluke under discussion were seen at this examination, although they had been found in previous examinations, and were also found subsequently. This fact is mentioned to show the necessity of repeated examinations in suspected cases, for if there is no point in the bowel that is ulcerating at the time, it is probable that no eggs will be present. It seems to be a well-established fact that the fluke does not thrust the eggs directly into the bowel but into the submucous tissue,

and that they act as a foreign body and eventually ulcerate out into the bowel.

June 8th. Patient was given 45 grains thymol in three doses and expelled eight hook-worms. Subsequent examinations showed none of the eggs of this worm present in the fæces.

June 16th. The patient left hospital. All œdema was gone, and there was no dyspnœa when patient walked about. Prolapse of rectum and dysentery had also disappeared, and patient declared that he was suffering no inconvenience whatever.

The microscope showed under a single cover-glass several eggs of *Schistosoma japonicum* and half a dozen embryos outside the shell moving their bodies vigorously, assuming all sorts of shapes, but making very little progression. The pressure on the cover-glass had been very moderate, and I am inclined to think that they had hatched out of the eggs after the stool was passed, about four hours previously, the weather being very warm. The movement of the cilia was very active, and the sac connected with the protuberance more clearly outlined. This was the first time I had ever seen movement in the embryo, but other examinations had been made in cool weather.

The third case is one seen by Dr. H. B. Taylor, of Ngankin, Anhuei Province, and I am indebted to him for the notes on the case, which has just been reported to the *China Medical Missionary Journal*. His case is interesting because there was no infection with the hook-worm, as was the case in all previous infections found in China, including Catto's, and it is of further interest because the patient was not œdematous, but on the contrary was much emaciated. The notes on the case are as follows :—

"The patient, a Chinese boy, aged 11, was a native of Wang Chiang Fu, about forty miles from Ngankin, near the Kiangsi border. He gave a history of chronic diarrhœa of many years' standing. The stools were bloody at times. Accompanying the diarrhœa there had been gradual enlargement of the abdomen and progressive weakness and emaciation. No history of œdema at any time.

"The boy was extremely emaciated, face, body, and extremities. Liver much enlarged, and three or four finger-breadths below the costal margin very tender, with rough nodular feeling on palpation through thin abdominal walls. Spleen also much enlarged, tender, but without nodular feeling. Intestines distended with gas.

"The first time the patient came to our dispensary the stools were formed and contained no blood microscopically. On examination, the ova of *Schistosoma japonicum* were found in small numbers, along with many of *Ascaris lumbricoides*. Subsequently the patient returned with dysentery. The ova were again found. This diagnosis was kindly confirmed by Dr. Logan, of Changteh, to whom I sent a specimen, and whose cases of schistosoma infection were reported in the *China Medical Missionary Journal* last year.

"At this time the boy was weaker, and more emaciated than at the previous visit. His abdominal symptoms remained as before. He remained three weeks in the hospital on iron and tonic treatment without material benefit."

It would thus appear that the disease under consideration is widely distributed in China, as it is now definitely settled that the three provinces, Fukien, Anhuei, and Hunan, each being separated from the other some hundreds of miles, furnish cases of the disease.

THE HÆMOGREGARINE OF MAMMALS (*H. BALFOURI*), AND SOME NOTES ON RATS.

By J. Burton Cleland, M.D. Ch.M.Syd..

Government Bacteriologist and Pathologist, Perth, W. Australia.

(From the Pathological Laboratory, Department of Public Health, Perth, W.A.)

It may be of interest to record, for Western Australia, the occurrence in a specimen of *Mus decumanus*, the "Norway" rat, of a hæmogregarine apparently identical with that referred to by Dr. Balfour in his article on the "Hæmogregarine of the Jerboa," in the Journal of Tropical Medicine for March 15th, 1906. In speaking of *H. balfouri* of the Jerboa, he says: "I have recently discovered what seems to be the same parasite in the mononuclear leucocyte of the Norway rat (*Mus decumanus*) in Khartoum. It is probable that it exists as a leucocytozoon in the rodents, but further observations are required."

The rat in which the leucocytozoon was found was one of many received and examined in this Laboratory in connection with plague work. Many of these were dead when received, but some were alive, and films of blood and smears from the organs were examined in a number of instances, and always when pathological conditions were present. In all the many preparations examined in this way this was the only instance in which the leucocytozoon was met with. Trypanosomes were frequently seen, but it is interesting to state that they were only encountered in those rats which were examined immediately after death. It is a remarkable coincidence that it was on the day after reading Dr. Balfour's article that the protozoon was discovered, and that neither before nor after that date have I again encountered it, though it could hardly have escaped notice had it been present. This particular rat, which had been kept alive in the Laboratory for about a fortnight, was given chloroform, and examined, when the only point noticed was a somewhat enlarged spleen. Only two blood smears were unfortunately obtained, both of which show fairly numerous beautiful examples of a leucocytozoon in the protoplasm of the mononuclear leucocytes. This parasite agrees perfectly with the figures and description in Dr. Balfour's article, and is, I think, undoubtedly the same. Sections were made of the liver and spleen, but no parasites were found in the fixed cells of these parts, though one was seen in a leucocyte in a capillary of the liver.

In the smears from the organs of this rat, made immediately after death, cocci and bacilli of several species were seen. It happened that at this time we lost a number of rats which we were keeping for experimental purposes. In those of them which were chloroformed while sick we found in smears quite a

number of organisms, though of course in these there could have been no *post-mortem* increase. Some of these were even bipolar, and suggested at first infection with plague. I could not account for some time for this apparent epizootic, in which were present during life so many diverse organisms. However, we found that in many instances the hind-legs were œdematous, and on examining the soles of the feet, ulcers of varying size were almost always found, swarming, of course, with bacteria. This condition was undoubtedly due to damp cages, and ceased when this defect was rectified. It suggests that even in their natural haunts this species of rat must suffer severely from the dampness accompanying floods and heavy rains, which possibly may have a checking effect on their numbers, and drive others to drier localities.

"C. R. Soc. Biologie," T. lx., pp. 349-350.

GLOBULAR RESISTANCE IN BILIOUS HÆMOGLOBINURIC FEVER.

Vincent, H., and Dopler, C., state that a chronic malarial subject cannot absorb quinine without provoking a crisis of hæmolysis.

His red corpuscles are constantly less resistant to quinine than those of healthy people, and become even less so during such a crisis. Treated with hypotonic solutions of sea-salt the corpuscles, constantly less resistant than those of the healthy, are even less so from the access of a crisis initiated by quinine.

After some days their resistance returns to the normal, and this enhanced resistance may be explained from the formation of new bodies in the blood as a sequel to the auto-hæmolysis. It may be noted that nine days after the crisis the serum of such a subject becomes less agglutinatory for its own corpuscles.

Searching for some explanation of the diminished resistance to quinine, the authors examine and reject the following hypothesis: That there are an insufficiency of "antisensibilisatrice," or an excess of cytase, or a lack of anticytase. We are left to suppose that the corpuscles are more fragile either from an insufficiency of the lepoid substances described by Overton or by a want of salts. In support of the latter supposition, they remark that, on the one hand, preventive injections of artificial serum in the patients may initiate a crisis of hæmoglobinuria, while on the other, the red corpuscles taken at the full crisis when their resistance to hypertonic solutions is at its least, may be rendered more resistant by prolonged contact with a less concentrated solution (1 to 100, about,) of chloride of calcium.

"Lancet," August 16, 1906, p. 438.

(SPIROCHÆTA DUTTONI.)

Stephens, Dr. J. W. W. The note concerns itself with methods of staining, especially with the demonstration of the flagellæ. The nitrate of silver method failed in the author's hands owing to the difficulty of cleansing the spirochætes from the albumucous blood plasma, even after repeated centrifuging and washing. He, however, obtained beautiful results by the following methods: The material was centrifuged and washed three or four times in normal salt solution. Films of the deposit were then made, and after mordanting, stained with gentian violet. The following forms were observed: (1) With terminal flagella no bipolar or peritrichous flagella were observed; (2) linked forms; (3) eviscerated forms, probably due to mechanical or chemical action. In many cases a sort of sheath was observed.

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THE

Journal of Tropical Medicine

OCTOBER 1, 1906.

KITASATO'S SUGGESTION OF AN INTERNATIONAL CONFERENCE TO FIGHT PLAGUE.[1]

PROFESSOR S. KITASATO suggests that a national conference be formed to fight plague in India and South China. This opinion is the result of close observation of the epidemiology of plague ever since 1894, when Kitasato first discovered the plague bacillus in Hong Kong. He is of opinion that it is useless to fight plague by the present means, each nation individually enforcing quarantine laws, passing special regulations, disinfecting cargoes and people, and applying locally and generally all the paraphernalia attaching to modern hygienic measures. Kitasato is of opinion that the foci of the disease must be dealt with, and as at present India and South China are the chief seats of plague the battle has to be fought at these cradles of the disease. There can be no doubt that the Japanese and several nations in Europe blame British laxity of action for the present state of the world in regard to plague, and we have already, in this Journal,

[1] A paper read at the third annual meeting of the Philippine Islands Medical Association, March 3rd, 1906, and published in the *Philippine Journal of Science*, June, 1906. By Professor S. Kitasato, of the Institute for Infectious Diseases, Tokyo, Japan.

broached the question of interference of other countries in a matter which, as regards India at any rate, is wholly a British question. That interference has entered many minds there can be no doubt, and it comes to this: Are we to muddle through and allow things to drift on as they are doing, or wait for a request from other nations to take the matter in hand?

No doubt regard for British sensitiveness has restrained other Governments forwarding a request of the kind, but if plague recurs in India during the coming winter, to the extent it did during the winter of 1904-5, there are indications that a combined request may be forthcoming. Kitasato has publicly voiced the matter, and in his speech he asks the President of the United States of America to take up the matter. His words are as follows: "My suggestion only lacks a leader, and I see that the United States, one of the greatest nations of the earth, has such a leader in the person of its President, Theodore Roosevelt, who has already done so much for humanity and whose noble works are being admitted by the whole world." A better leader in a movement of the kind than the President of the United States it would be difficult to find; but surely, with the warning of what may be impending before us, it is possible to find a man or men of British nationality to forestall the interference and to rise to the occasion. What is to be done is another matter, and what is not being done in India is not perhaps so apparent; but that what we are doing is not satisfactory to people of other countries is becoming evident. Interference in Indian matters, military, political and medical, by the home Government, or by Parliament, has been, and is, a delicate question; and it is the desire to spare the feelings of Indian public servants generally that has deferred the enforcement, and not only the enforcement but even the direct suggestion, of many public questions which those outside India regard as requiring amendment. In the public press, in the meantime, the subject of "Our Failure in India" is being discussed. We have not failed in India, we have brought peace, order and security of tenure to some 300,000,000 of people where there would have been strife, bloodshed and chaos. Were Britain to have done nothing else, her rule in India has entitled her to the highest pinnacle of fame, and the men who have gained for her an unequalled place in history by their work in India are entitled to all the honour, fame, and consideration that can possibly be bestowed upon them. Still, according to other people, in regard to this question of plague epidemics, all is not as it should be, and we are submitted to the mortification of a Japanese scientist asking the President of the United States to undertake work which, in public opinion, we are not equal to. Kitasato states that plague, "however obstinate its ravages, could be fought and vanquished by the persistent efforts of man." The expenditure of "efforts, however laborious, the money, however vast, can be of no value unless they be accompanied by the application of scientific knowledge." According to Kitasato we are evidently lacking in the scientific knowledge necessary, and by allowing matters to drift we are inviting interference, which, when it comes, we will resent, and the sensitive occupants of the field in India will regard as an insult to their service.

Are we doing nothing? By no means; we have sent out commissions to investigate, but it seems to most people that the day for investigation is over, that the bacteriologist and the microscopist have done their work, and the *régime* of the practical sanitarian is required, not merely detailing for plague duty several already overworked men of the Indian Medical Service, but the temporary creation of an army of workers, not in hundreds but in thousands, to deal with plague. As Kitasato says, the money spent for this temporary work would be less than the plague expenditure incurred by the world at the present moment from quarantine hindrances, disinfection, expenses, loss of trade and loss of life. Unless a step of the kind is taken, and that speedily, we will have to bear the chagrin of the interference, justifiably or unjustifiably, of other nations coming forward and requesting us either to mend our ways and eliminate plague, or to allow them to do the work we are avowedly incapable of. J.C.

BRITISH MEDICAL ASSOCIATION MEETING AT TORONTO, AUGUST, 1906—ABSTRACT OF PROCEEDINGS.

Obstetrics and Gynæcology.

President: Dr. W. S. A. Griffith (London.)

Professor A. H. Wright (Toronto) introduced the subject of "Concealed Accidental Hæmorrhage in the Latter Part of Pregnancy, before the Effacement or Dilation of the Cervix." He pointed out that the patient in such cases suffered more from shock than from actual loss of blood. The treatment recommended was morphia to the extent of 1 grain in one hour if severe shock threatened. Dr. W. S. A. Griffith stated that dangerous hæmorrhage, of the nature referred to by Prof. Wright, was very rare; when, however, such occurred, in cases in which the cervix was tough and undilatable section of the uterus (vaginal) should be done; in multiparæ, when the os and cervix were capable of dilatation this should be done along with bipolar version. Dr. Temple (Toronto) and Dr. Murdoch Cameron (Glasgow) condemned Cæsarean section for an ailment of this nature, nor was vaginal section of the cervix necessary according to Dr. Temple. Dr. Cameron stated that he had never seen a death from concealed accidental hæmorrhage in the latter part of pregnancy.

Chronic metritis and arterio-sclerosis of the uterus were discussed by Drs. Gardner and Goodall (Montreal). In uterine arterio-sclerosis, Dr. Barker said that nothing short of hysterectomy was of any use.

Dr. A. E. Giles (London) described the results of 146 consecutive cases of ventri-fixation of the uterus; the benefits in many instances were stated to be most marked. This subject was discussed by Drs. Bovée (Washington), Dudley (Chicago), Gardner (Montreal), Gilliam (Ohio), Temple (Toronto.)

"Changes in Uterine Fibroids, after the Menopause, with Reference to Operation," was dealt with by Dr. C. A. L. Reed (Cincinnati). He advocated removal of uterine fibroids occurring about the time of the menopause. This conclusion was refuted by Dr. J. T. W.

Ross (Toronto), who stated that a fibroid was merely an outgrowth of the muscular tissue of the uterus, and cancerous development in tumours of the kind was rare. Even in young married women small uterine fibroids might exist without causing trouble, and that their removal could not be undertaken without serious danger to the patient. The comparative harmlessness of fibroids, in proportion to the number of actual cases, was insisted upon by Dr. Byford.

Dr. H. L. Reddy (Montreal) brought forward the indications for Cæsarean section, other than in pelvic deformities and tumours.

"The Appendix Vermiformis in Relation to Pelvic Inflammation" formed the subject of a paper by Dr. Helme (Manchester). He discussed the association of inflammation of the appendix and pelvic organs, believing that contiguity rather than continuity of structure was the explanation of the association. Appendicitis, according to Dr. Helme, is a frequent source of dysmenorrhœa and its associated mucous colitis, but the association of appendicitis with pelvic disease is the exception and not the rule. The appendix, Dr. Helme regards, not as a vestigial structure but as a differentiated part of the intestinal tract which plays a high and important part in digestion. He condemns the removal of the healthy appendix during operations for pelvic disease. Dr. Lockyer (London) dealt with the relationship of appendicitis to pregnancy, and the treatment of the conditions when the two are combined.

Prof. Murdoch Cameron (Glasgow), in a paper entitled "Antistreptococcus Serum in Puerperal Septicæmia," advocated its use in puerperal fever in which there is but little laceration of the soft parts, but condemned its application as useless when the fever was due to traumatism.

The subject of "Eclampsia" was introduced by Dr. Evans (Montreal); he referred to Edebohls' treatment for eclamptic anuria by renal decapsulation. Lumbar puncture, introduced by Helme, had not proved successful. Dr. Temple (Toronto) favours blood-letting, the use of morphia, and where the cervix is dilatable the induction of labour in the treatment of eclampsia.

Section of Dermatology.

President: Dr. Norman Walker (Edinburgh).

"The Influence of Light-hunger in the Production of Psoriasis" was introduced by Dr. J. N. Hyde (Chicago). He said that one statement was that psoriasis never affects the lower animals because their skins are exposed to light. Another, that were psoriasis in man due to light exclusion the number of persons attacked would be few: the parts of the body attacked coincide with those least exposed to daylight; the disease should be localised in light-excluded parts; the rational treatment would seem to be that by illumination. Dr. Dühring did not agree with Dr. Hyde as to the etiology of psoriasis; it is certainly not parasitic, and the treatment by local measures are well-nigh useless, internal treatment presenting the only hope of relief. Dr. L. D. Buckley (New York) said local treatment was inadequate, and that the altered condition of the system permitted the growth of organisms. Drs. G. H. Fox (New York) and W. T. Corbett (Cleveland) remarked on the apparent immunity of the Negro Race. Dr. Gilchrist (Baltimore) believed psoriasis to be of parasitic origin, and advocated the use of X-rays in the treatment of the disease.

"Bullous Eruption" was discussed by Dr. J. C. Johnston. He contended that bullous eruptions were autotoxic in origin, and required treatment by diet, laxatives, diuretics, exercise, hot-air baths and pilocarpin.

Dr. Graham Chambers gave a clinical demonstration of the treatment of ringworm by means of a preliminary X-ray epilation before applying the usual remedies.

"Errors in the Treatment of Cutaneous Cancer" were discussed by Dr. A. R. Robinson. He said no fixed rule could be applied to the treatment of these ailments; excision is unsuited for cancer on the skin of the face; X-ray treatment is of no value where the deeper structures are involved, and ought to be confined to certain specific forms; when X-rays are employed the superficial cutaneous layers and nodules ought to be removed by applying X-rays. Dr. R. W. Taylor (New York) maintained that coincidently with primary local syphilis the whole system becomes affected by way of the blood rather than by way of the lymphatics.

"The Wrong and the Right Use of Milk in Certain Skin Diseases" was the subject of a paper by Dr. L. D. Bulkley. In cases of acne, eczema, and urticaria he found milk, given one hour before meals, when the contents of the stomach were alkaline, was absorbed without previous caseation, and proved beneficial; a vegetable diet should be combined with the milk treatment.

MALARIA IN GREECE.

Liverpool School of Tropical Medicine.

Sir Alfred Jones, K.C.M.G., gave a lunch yesterday, at the University Club, to Dr. Savas, of the University of Athens, Physician to H.M. the King of Greece. Owing to ill-health Sir Alfred was unable to attend, and in his place the Lord Mayor of Liverpool (Alderman J. Ball) presided. Among those present were: Lord Mountmorres, Professor Boyce, Professor Ross, Professor Carter, Professor Bosanquet, Dr. Caton, Dr. Hope, Dr. Utting, Dr. Todd, the Rev. Arch. Gabriel, the Hon. J. L. Griffith (U.S. Consul), Mr. T. H. Barker (Secretary, Liverpool Chamber of Commerce), and others. A telegram was read from Sir Alfred Jones thanking the Lord Mayor for taking the chair. A letter was received from Mr. Mataxas, Minister for Greece in London, thanking the Liverpool School for their help in the movement for suppressing malaria in Greece.

On the proposition of the Lord Mayor, the loyal toast and the health of the King of Greece were honoured. The Lord Mayor then proposed the health of Professor Savas.

Professor Savas, in responding, said that he was sorry he could not speak the English language sufficiently well to express all he wished, but he desired

to say how he thanked H.R.H. Princess Christian for her assistance to the cause he represented, Sir Alfred L. Jones for the great help he had given the Liverpool School of Tropical Medicine, and Professor Ronald Ross. The interest shown in this country in the movement for the abolition of malaria in Greece was one of many instances of the kindness that Great Britain had always shown to his country.

Dr. Ronald Ross then gave an address dealing with malaria in Greece. He explained that on the invitation of the Lake Copias Company, Limited, he was sent out to Greece at the instance of the Liverpool School of Tropical Medicine to investigate malaria in that country. He went to Greece last May, and found such a condition of affairs as decided him to report to the Liverpool Tropical School and to the city generally. The way to investigate malaria was to examine the condition of the school children, and in the course of this work he found in one village 38 children out of 80 affected; in another 13 out of 40; in another 25 out of 50, and in a mountain town 16 out of 100. In the city of Thebes the proportion was only one in 50. The general statistics applying to the whole country showed that out of a population of two and a half millions roughly there were about a quarter of a million cases a year. There were 250,000 cases of malaria per year, and the deaths were about 1,760. Last year there was a bad epidemic, and the cases amounted to 960,000, the deaths numbering 5,916. On the average there had been, roughly speaking, two attacks of malarial fever for every five persons in the country last year. Of such a state of things they could have no conception in this country, for it was not a case of having the disease once, like measles or scarlatina, but the trouble came week by week and month by month. It was evident that the ancient civilisation of Greece was checked by some cause, and he was of opinion that the cause was the spread of malaria. The disease was probably introduced or reinforced by the natives of Asia, introduced by their Greek conquerors. They had a modern instance of the same sort of thing in the Mauritius in 1866, when the disease swept round the coast and ruined the place. Probably the event took place about the time of Pericles, and it must have done a great amount of harm. In considering the causes of the rise and fall of nations they were apt to overlook the influence of disease. The movement for the suppression of malaria was supported in influential quarters, and they hoped to obtain the support of the Liverpool people.

Mr. W. Watson Rutherford, M.P., said that Liverpool, with its associations all over the world, should take cognisance of a proposition laid so influentially before them. Very valuable work had been given in the direction of checking malarial disease by Dr. Ross, Prof. Boyce, and Dr. Todd.

Mr. Daniel Steele, General Manager of the Lake Copias Company, Limited, expressed his appreciation of the help extended to Greece in that matter, and his conviction that satisfactory progress would be made.

The Hon. J. L. Griffith, U.S. Consul, also spoke, and said that Liverpool had now the opportunity of paying part of the debt which all civilisation owed to Greece.

On the proposition of Lord Mountmorres the health of the Lord Mayor was drunk and the proceedings ended.—*Liverpool Courier*, September 18th, 1906.

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NOTES ON PLAGUE IN INDIA.

Rat Destruction.

The difficulties connected with rat destruction are many. One is the religious difficulty, as amongst several communities taking of life of any living thing is a strict tenet to be observed. Another, however, is more quaint; it seems that some people object to the rats being destroyed because they cannot then be warned when plague threatens; death amongst rats being a sure sign that plague will attack human beings. So far has this curious form of prophylax is seized upon the minds of natives that the British resident in Mysore finds it necessary to "dissipate the idea that it is useful to have rats in order that their dead bodies may give warning of the presence of the disease."

In the Punjab the decrease of mortality from plague was less by 300,000 during the first six months of 1906, compared with the corresponding period of 1905. To the destruction of rats is this fortunate result chiefly attributed.

Poona is suffering from a severe recurrence of plague. On September 11th and 12th, 268 persons in the city died of the disease.

Monkeys and cats are reported to be suffering from plague in some districts of the United Provinces.

Clemesha, W. W., Captain I.M.S., in an article in the *Indian Medical Gazette* of September, 1906, on "An Account of Plague in Bengal," states: "That for the spread of plague the presence of large numbers of rats is the chief factor; insanitary houses are also an element in the spread, but chiefly from the fact that such houses are obviously an abode for rats." People engaged at certain trades seem to be especially liable to plague, but when these come to be looked into it is found that it is not the trade itself that is the cause, but the environment in which the trade is carried on, that determines the presence of the disease. It is almost always the village shopkeepers who are first attacked by plague, and these men conduct their work in dark, rat-infested godowns, sheds, and grain-stores. So strong is Captain Clemesha's belief in the infecting power of the rat that he states: "A house so constructed as not to be suitable for rats to live in and not containing any food to attract rodents, would probably remain non-infected unless a case of pneumonic plague was placed in it." In Eastern Bengal plague does not now prevail, nor has this province at any time during the past ten years suffered severely from plague; the reason may be, that in this part of Bengal the villages are long, straggling lines of houses; each house usually is buried in a thicket of bamboos and rank vegetation in its own compound and at some distance from the neighbouring houses. Rats are not so plentiful in houses of this type as in the closely packed mud houses met with in such districts as Bihar, where plague is rife.

Immediate Incision into Plague Glands.

Nesfield, V. B., Captain I.M.S., in the *Indian Medical Gazette* of September, 1906, argues in favour of early incision, in cases of bubonic plague, with the object of preventing toxin absorption. He states that in plague, as in other septicæmic infection, the specific organisms in the lymphatic gland are engaged in rapidly elaborating toxins which are readily taken up by the lymphatic and vascular systems and so produce a condition of poisoning. Within the gland, in time, however, the organisms themselves, owing to their numbers, cannot be accommodated in the space, and gaining the lymph and blood streams cause septicæmic lesions. The presence of the toxins in the blood tend to lessen the power of the resistance of the blood to the organisms, so that the longer the toxins are being absorbed the greater the ease with which the organisms gain access to and ascendancy in the blood. To prevent the further absorption of toxins, and subsequently of organisms, Captain Nesfield recommends that, where possible, every superficial gland should be opened with as little delay as possible. The gland should not on any account be excised; a simple incision should be made deeply into the substance of the gland, so that the toxic serum and plague organisms may have free exit, but the cellular tissues and periglandular lymphatics should not be disturbed. After opening the gland Captain Nesfield pours strong tincture of iodine lotion, about 2½ per cent., into the cut surface, and foments the part by lint soaked in the same fluid.

Reviews.

The Extra Pharmacopœia: Martindale and Westcott. Twelfth Edition. London: H. K. Lewis, 136, Gower Street, London, W.C., 1906.

A revised edition of this useful publication is to hand. It is not, surely, necessary to dwell upon the excellence of this well-known book. Every medical man must have it at his elbow if he hopes to be cognisant of all that is most recent in therapeutics and the rational treatment of disease. The present volume extends to 1045 pages, and there is not a page too many, nor a line that can be spared. The labour, the care, the precision and the literary efforts involved in the production of the "Extra Pharmacopœia" have always excited our admiration, and the additions to this, the twelfth edition, still further bear out the reputation of its predecessors. We have frequently, when new drugs are forwarded to us from tropical countries, especially those in use by the natives, consulted Dr. H. Harrison Martindale concerning them, and in almost every instance he has been able to point out to us that the "new" plant or drug is dealt with in the "Extra Pharmacopœia." The chapters on Organotherapy, on Analytical Memoranda, and the Therapeutic Index of Diseases and Symptoms are special features of the twelfth edition, and we cordially acknowledge the debt we owe to the authors, W. Harrison Martindale, Ph.D., and W. Wynn Westcott, M.B., D.P.H., for the services they have rendered to British medicine by their arduous labours.

Correspondence.

THE TRUTH ABOUT BERI-BERI.

To the Editors of the Journal of Tropical Medicine.

Sirs,—You will perhaps allow me a small amount of your valuable space to acknowledge the whole-hearted acceptance by Dr. H. Wright in your Journal of August 15th (vol. ix., p. 246, 1906) of the truth of the observations I have set forth (*Journal of Hygiene*, vol. iv., p. 112, 1904, and *British Medical Journal*, vol. i., 1904).

Whilst he substantiates my observations so strongly as actually to claim them as his own, there will be many who will regret with me that he did not give public renunciation of the statements he had made ("Studies from the Institute of Medical Research," vol. ii., 1902) some time during the two years or so that elapsed between our several publications. This would have saved me from the unpleasant task of correcting some of his errors of fact and inference in detail, a task which two well-known men of science strongly urged upon me as a "matter of public duty."

I remain, Sirs, yours, &c.,

Hereford, *September*, 1906. Herbert E. Durham.

Drugs and Remedies.

Dr. Prendergast's diarrhœa pill:—

℞	Bismuth salicylate	grain 1
	Salol	,, ½
	Calomel	,, $\frac{1}{40}$
	Camphorat. tinct. of opium ...	mins. 2
	Aromat. chalk powder	q.s.
	Cinnamon oil	q.s.

For one pill.

Foramint (*Medizinische Klinik*, No. 16, 1906).—Daus, Dr. S., of Berlin, speaks highly of the disinfectant action of formic aldehyde on mucous membranes. Hitherto the use of even very dilute solutions of formic aldehyde, owing to its extreme irritability, has prohibited its use, but by combining it with milk sugar this difficulty has been partly overcome. It is as a disinfectant for the mouth, fauces, tonsils and pharynx that this combination, named foramint, in the form of lozenges, has come into use. In acute follicular tonsillitis, mumps, quinsy, diphtheria, middle ear disease, foul tongue and breath, and as an oral disinfectant generally, foramint would seem to be more efficient and more practically useful than attempts at gargling or swabbing out the throat, which are often well-nigh impossible and always imperfect. We have tried foramint, and find the remedy to be both pleasant and efficient in mouth and throat affections.

Notes and News.

Thankful for Small Mercies.—From a recent circular: Church Missionary Society, Medical Mission, Yezd, Persia . . . . The hospitals are now, thanks to God's blessing on our work, so crowded as to be very insanitary, and the Women's Hospital is totally unsuitable for its purpose.

Dr. S. C. Legge, Surgeon of the B. I. steamer "Jelunga," has died in the General Hospital, Calcutta, of acute pleurisy, at the early age of 35 years.

How not to Do It.—At a recent meeting of the Bombay Corporation, during a discussion on the campaign against rats, Mr. Todd said he was assured by his Hindu friends that they perfectly realised the necessity of getting rid of rats. They set traps for them and caught them, but as they could not kill them, they let them loose in drains and open spaces.

A Correspondent of the *Indian Pioneer*, signing himself "Medico," complains of the absence of all practical teaching of Midwifery in the University of Lahore. It must be confessed, however, that the peculiar social system of India renders attendance of students in actual cases of labour almost impracticable. It is only as a last resource, in desperate cases, that a male practitioner is ever called in, and it is practically certain that even such cases would be left without competent assistance altogether, if students were allowed to accompany the practitioner called in. During twenty years' practice in India, though often called upon to perform craniotomy and other obstetric operations, the writer never had the opportunity of attending a normal labour in a native, and under such circumstances it is difficult to see how practice in this department can be arranged for students. This may be unfortunate, but, it is to be feared, is unavoidable.

The Health of Bombay.—A Bombay message to a contemporary says: The condition of public health in Bombay continues to be unsatisfactory. The mortality last week was only a hundred short of double that of the corresponding week of last year. The main cause of this exceptional unhealthiness is the prevalence of cholera and choleraic diseases. There were 119 deaths from cholera — the highest total reported during this epidemic—and 99 from diarrhœa. But although the figures are higher than before, there are signs that the epidemic is about to wane, and unless abnormal conditions supervene the presence of the disease in our midst should not be protracted much longer. The unusual continuance of cholera in the city at this season has brought the water supply under suspicion, but these apprehensions are not founded on fact. The disease is spread all over the city, and local outbreaks have shown themselves amenable to preventive measures; so that although the water supply may in parts be liable to pollution, this cannot be the source of infection. Undoubtedly the food and milk supply of the people at this time of year has a good deal to do with the prevalence of diarrhœa, and that predisposes to cholera when the latter disease is about. The carelessness of the mass of the population in exposing their food and milk to flies and dust is also notorious, and this is a serious factor in the spread of infection.—*Pioneer Mail*, August 10th.

Major Ernest Roberts, I.M.S., has just brought out an extensive work on enteric fever in India, published by Thacker, Spink and Co., Calcutta. As yet we have only before us a highly eulogistic review in the *Indian Pioneer*, a lay paper, which, however, frequently notices scientific works on subjects which, like the present, are of high public importance.

As Secretary to the Sanitary Commissioner and Statistical Officer to the Government of India, Major Roberts has had exceptional opportunities of studying the incidence of typhoid, so that the work can hardly fail to be of great practical value.

Major Roberts shows that typhoid for many years has been, and is still increasing, and this in spite of almost every cantonment having been supplied with excellent water. Added to this, enormous improvements have been accomplished in the care and cooking of milk and other articles of food, and in the housing and well-being of the soldier, in numberless ways, and all, as far as enteric is concerned, absolutely to no purpose. One thing alone has remained unchanged, and that is the official system of conservancy, which is still on the "trenching system." It is refreshing to find this pernicious military medical fetish attacked by one of the Inner Simla Circle, and it is a healthy sign of the times that such an one should be able to venture to attack it; for certainly, until lately, the heretic who dared to attack the sacred trenching system would have been hardly likely to stay long at Simla.

We trust that the Indian Government will see its way to adopt Major Roberts' suggestion of water carriage to septic tanks, as the present plan of distributing typhoid dust, by spreading the infected night-soil out in the sun, with a thin layer of dust over it, is so against rhyme and reason that it is marvellous that it should have been so long supported by the medical authorities in India.

Plague in Calcutta.—Dr. Pearse's report on plague in Calcutta during the year ended June, 1905, was submitted in August last. Dr. Pearse establishes a number of striking conclusions concerning plague as it operated in this city. He shows that the alleged comparative immunity of women is a delusion. The proportions of men and women attacked are precisely the same as the proportion of men and women in the total population. If fewer women are attacked this is because there are fewer women than men. Another lesson from the experience of Calcutta is that the danger of infection by personal contact with plague patients is much less than has been generally supposed. The great majority of plague cases occurred in separate houses, that is, plague patients did not infect other inmates of the dwelling. The result of Dr. Pearse's direction of the anti-plague campaign has been a flood of light thrown on the causes of death in Calcutta. In many cases, at ordinary times, no medical man is in attendance and the cause of death is not ascertained. The special arrangements in connection with plague have dispelled this ignorance, and revealed an unsuspected prevalence of phthisis, tetanus, and a number of obscure diseases.—*Pioneer Mail*, September 7th, 1906.

An Appeal from Western China.—Bishop Cassels has written from Tao-ning, Western China, a letter on behalf of missionary work in China, in which he

says: "It is many years since we have been so destitute of any medical help in this station and district as we are just now. Even though we had no doctor, we nearly always had some qualified nurse and someone who could undertake dispensary work; but now we are absolutely without any help of this kind, and the workers are so busily occupied that in case of any sickness requiring nursing we should be in a very difficult position." Those who would like to hear further on this matter should apply to Miss E. Van Sommes, Cuffnels, Weybridge. — *The Hospital.*

THE NUWARA ELIYA'S DISTRICT MEDICAL OFFICER.—Dr. Frank Grenier's *selection* as Ceylon's first representative to the London School of Tropical Medicine may be regarded as a compliment to the District Medical Officer of Nuwara Eliya, who has the reputation at the sanatorium of having proved a worthy successor to the late Dr. W. G. Woutersz. Dr. Grenier does not leave for Europe till next year.

BEHRING'S REMEDY FOR CONSUMPTION: TULASE.—The material produced by Professor Behring for the cure of consumption, "tulase," consists of a clear liquid prepared by treating tubercle bacilli with chloral. A toxin, differing from Koch's, has been obtained from the tubercle bacillus, which is stated to continue the process of immunisation where Koch's tuberculin leaves off. Although tolerance to tuberculin may be established, persons so treated are not immune against the tuberculosis caused by Koch's tubercle bacillus, and it is to continue the beneficial effects of Koch's tuberculin that Behring has been striving after. Tulase contains the bodily substance (somatic) of Koch's bacillus. It may be introduced intravenously, subcutaneously, or by way of the stomach. The best result is obtained when tulase is given in the form of an immunising milk by the stomach. Tulase is not on the market, and will not be so, until the exact dosage and methods of exhibition are positively determined.

Personal Notes.

INDIAN MEDICAL SERVICES.

Arrivals Reported in London.—Captain F. Wall.

Extensions of Leave.—Major T. W. Irvine, study leave, July 1st to 7th, 1906; Captain V. E. H. Lindesay, 6 m. furlough; Captain D. C. Kemp, 9 d. extraordinary leave; Major A. Street, study leave, May 16th to August 15th, 1906; Captain H. Meakin, 6 m. medical certificate; Colonel R. Macrae, 3 d.; Captain L. Reynolds, 6 m. medical certificate; Lieutenant J. W. H. Babington, 3 d.

Permitted to Return to Duty.—Lieutenant-Colonel A. Milne, Major T. C. Clarkson, Major H. Austen Smith, Captain A. T. Pridham, Colonel R. Macrae, Lieutenant-Colonel O. H. Channer, Captain G. Tate, Captain R. Bradley, Nursing Sister Miss M. E. Gray.

Postings.

Captain Hunter, services placed at disposal of Government, United Provinces.

On return to India from leave, Lieutenant-Colonel Cunningham becomes Civil Surgeon of Umballa, while Lieutenant-Colonel Adie returns in the same capacity to Ferozepur, and Lieutenant-Colonel Coates to Lahore.

Lieutenant R. T. Collins, R.A.M.C., to hold additional civil medical charge of Roorki.

Surgeon-General Trevor is confirmed as P.M.O., Western Command, and Surgeon-General Slaughter to be P.M.O., Eastern Command, *vice* General Gubbins, appointed P.M.O. in India.

Home Department.—The services of Major Macrae and Captains O'Neill, Scroggie, and Rogers are temporarily placed at the disposal of the Madras Government.

The services of Captain Justice are lent permanently to Madras.

The services of Captain Roberts are lent temporarily to the Punjab, and the services of Captain Bamfield are replaced at the disposal of the Commander-in-Chief.

Civil Assistant Surgeon Rai Sriput Sahai to be Civil Surgeon, Hamurpur.

Promotion.

Captain Vivian Boare Bennett, M.B., F.R.C.S., to be Major.

COLONIAL MEDICAL SERVICE.

Dr. W. B. Thain, Medical Officer of Ashanti, Gold Coast Colony, becomes Acting Cantonment Magistrate at Kumasi in place of Major T. A. Pamplin Green, who has arrived in England on six months' leave.

PLAGUE.

PREVALENCE OF THE DISEASE.

			Cases.	Deaths.
India.—Week ended	August	18th	—	1,451
,,	,,	25th	3,037	2,113
,,	September	1st	3,503	2,522
,,	,,	15th	4,304	3,134
Mauritius ,,	,,	13th	11	7
,,	,,	20th	13	7
,,	,,	27th	16	10

Hong Kong.—One case of plague during week ended August 26th. Clean Bill of Health issued.

Australia.—No cases of plague since June 30th. Rodents found infected in Brisbane in August.

South Africa.—No plague since November, 1905 Rodents occasionally found infected in East London.

Prescriptions.

MALARIA—ADMINISTRATION OF QUININE HYPODERMICALLY.

T. C. Wilson, in his "Text-book of Applied Therapeutics," gives the following preparations for hypodermic injection in malaria:—

℞ Quin. hydrochlorat ... ... grains 7½
Aquæ destil. ... ... mins. 15
For one injection.

℞ (Köbner's formula).
Quin. hydrochlorat ... ... grains 8 to 15
Glycerini ... ... mins. 30
Aquæ destil. ... ... mins. 30
For one injection; administered lukewarm.

℞ (When given combined with antipyrin).

Antipyrin	grains 6
Quin. hydrochlorat	grains 15
Aquæ destil.	mins. 30

For one injection.

℞ (Chlorhydrosulphate of quinine is recommended by Wilson).

Quin. chlorhydrosulphat ...	grains 7½
Aquæ destil.	mins. 15

For one injection.

℞ Sulphate of quinine may be administered when combined with tartaric acid.

Quin. sulphat.	grains 15
Acidi tartarici...	,, 8
Aquæ destil.	mins. 150

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the Journal of Tropical Medicine *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Ann. d'Ig. Sper.," T. xvi., p. 199.

On the Effect of Passage through the Intestines of Earth-worms or Soil Germs.

Guargena, G. With rather unimportant exceptions, the author finds that the intestinal flora of the worms is the same as that of the soil, and that bacilli, whether found naturally, or artificially added to the soil, are but little affected by passage through the intestine of the worm. A strain of *B. prodigiosus*, however, increased in virulence while *Staphylococcus citreus* attenuated rapidly. The author, however, demonstrates the important fact that worms can carry germs to considerable distances and infect the soil of their new resting place.

"Malaria in Tonkin and Northern Assam," pamphlet, 11 pages, with Titles and Charts.

Salanoire, M., undertook an extended enquiry to clear up certain points in the etiology of malaria in these regions.

His results are combined into a table giving (1) for each station the proportion of ♀ anophelinæ to 100 culicinæ for each month of the year; (2) two curves showing the average annual proportion of the two sub-families and the incidence of primary malarial attacks; and (3) a curve showing the monthly proportion of *Anophelinæ* and *Culicinæ* for all posts taken together.

Admitting, as indeed the author does, that curves of this sort cannot be taken as having an absolute value, it is obvious that except in two posts, there is a definite relationship between the commonness of *Anophelinæ* and the incidence of malaria. At Ha Gian, one of these exceptions, *Anophelinæ* are very scarce, though it is the most malaria-stricken place in Tonkin. The surrounding country, however, swarms with *Anophelinæ*, and Salanoire therefore concludes that the disease is contracted not at the post itself, but on the way to it. The other exception, Quang Yen, on the other hand, is regarded as a healthy station, so much so, indeed, that it has been chosen as the site of a convalescent depôt, but nevertheless the proportion of *Anophelinæ* is enormous.

Salanoire would explain this by the fact that most of the malaria cases are under treatment and so would rarely infect the insects, but it is obviously possible that it may be a matter of the species of anopheline which is common there. *Anopheles rossi*, for example, is rarely if ever a carrier of malaria. The author then gives some details of the forms of parasite observed, and clearly holds the theory of the specific unity of malarial parasites, and finally deals with the subject of bilious hæmoglobinuric fever, which he considers quite distinct from the paroxysmal hæmoglobinuria of Europe.

"Annales del Circulo Medico Argentino," 1905, p. 375.

Streptothrix Maduræ.

Greco, Nicolas. From the excellent clinical account given by the author of a case originating in an inhabitant of the Province of Santa Fé, in the Argentine Republic, it appears fairly certain that "Madura foot" occurs in that country. The patient had an inflamed lymphatic gland in the corresponding thigh, and Senor Greco isolated from the pus cultures of an organism, which he believes to be identical with Vincent's *Streptothrix* (*Discomyces*) *maduræ*.

"Ann. d'Ig. Sper.," T. xvi., p. 251.

A Case of Hæmogregarina Bovis.

Martoglio and Carpano. Working at the production of a serum for cattle plague, the authors found in a slide left over night some peculiar bodies which exhibited certain staining reactions.

Nothing similar could be found in the blood of the calf that had yielded the blood from which the slide was made, and the blood injected into a sheep produced no infection. But the structures are, nevertheless, described under the above name. Under the circumstances the authors would have been better advised had they refrained from naming these problematical appearances. It is very possible that a species of Hæmogregarine may be found at some future period in the blood of cattle, and as the identification of any such find with this should be called *Hæmogregarine bovis* is clearly out of the question; a very eligible name has been occupied to no better purpose than the gratification of the passion for species-making.

"Ergeln. d. allgem. Path. und Pathol. Anal. des Menschen und der Tiere," T. x., p. 305.

The Trypanosomiases from the Standpoint of General Pathology.

Sauerbeck, Ernst, whose recent work on the pathological anatomy of this disease specially fits him for the task, here follows out his subject in a sound and competent manner.

After a brief account of the morphology and phylogeny of the trypanosomes, the author first considers the non-pathogenic members of the group, such as the *Tryp. lewisi* of rats and *T. paddæ*, Laveran and Mesnil, and then proceeds to the consideration of the pathogenic species. Most space is devoted to *T. brucei* as in all respects the best known member of the group, and includes an able criticism of the views of Bradford and Plimmer (plasmodial and amœboid forms, &c.), and of Prowazek's sexual forms. Convenient tables are given of the liability to, and duration of the malady in different animals, as well as a good *résumé* of his own researches.

Surra, Caderas, and Dourine are treated in a few pages, and human trypanosomiasis occupies but three; Indian fevers and the Leishman-Donovan bodies are treated with greater minuteness, and he shows how Leishman's original theory has had to be modified by the work of Major L. Rogers, though he does not consider that the latter has demonstrated the presence of true trypanosomes in his cultures. He compares the examples of *Piroplasma donovani* with that *Halteridium* or *Hæmoproteus noctuæ* of Schaudinn.

He points out that the trypanosomes at present include a great variety of types, the extremes of which are the true trypanosomata, which are exclusively extracellular parasites, and the *P. donovani*, which is always intracellular, and pre-

dicts that subdivision of the group will be necessary. A short appendix on methods of staining is included.

"Zeit. chir. f. Hyg.," T. lvii., p. 512.

The same author gives an account of some work supplementary to his recent study of experimental trypanosomiasis, in which he demonstrated the capital importance of the macrophages in the destruction of trypanosomes. He now describes the appearances in the bone-marrow of a moribund guinea-pig infected with nagana, and of a rat with caderas, and confirms Prowazek's discovery of the presence of trypanosomes in the interior of typical polynuclear leucocytes.

"Lancet," September 22, 1906.

BLACKWATER FEVER DUE TO QUININE.

The journal comments on a case of the sort reported by Dr. A. D. Ketchen in the *South African Medical Record*.

The patient had suffered from malaria in East Africa, and recovered under quinine. Six months later, at Cape Town, he fell into ill-health and suffered from dysentery. Under these circumstances the malarial symptoms occurred, and on quinine being again exhibited he developed hæmoglobinuria, and frequent subsequent attempts to administer the drug—intentional and accidental—showed that the urine blackened within a very short time, even after such small doses as $\frac{3}{4}$ grain.

The *Lancet* appears to regard this as "conclusive"; but though no one questions that quinine may cause hæmoglobinuria in susceptible persons, as such cases are not very rare, it is quite a different matter to assume that toxic symptoms of this sort are identical with blackwater fever, and the readiness and rapidity with which the patient recovered from repeated attacks as soon as quinine was withheld appear to point to quite an opposite conclusion.

"Lancet," September 15, 1906, p. 718.

ANKYLOSTOME PARASITISM AMONG THE NATIVE WORKERS IN THE TRANSVAAL.

Posnet, W. G., records that as far back as 1904 he met with a case of ankylostomiasis in a native prisoner in the Johannesburg Gaol. He has since, as pathologist to the Johannesburg Hospital, investigated the prevalence of the disease amongst native African miners on the Rand, and found the ova of the parasites in the stools of 32 per cent. of the cases examined. Although not commonly a direct cause of mortality, he regards the disease as a potent cause of disability and diminished resisting power, and points out the danger to white miners, suggesting, indeed, that the outbreak in our Cornish mines investigated by Haldane and Boycott in 1902 was imported from South Africa, by Cornish miners who were driven to seek work at home by the late war. He has found the parasite in African miners coming from so many parts of British and Portuguese South Africa that he believes the disease to be very widely spread among the native tribes, and points out the danger to those engaged in the mining industry, white and black alike, unless suitable measures be taken to cope with the spread of the disease.

"Ann. Soc. de Méd. de Gaud.," T. xxxv., p. 231, and "Arch. Parasitologie," T. x., p. 160.

CONTRIBUTION TO THE STUDY OF TRYPANOSOMIASIS: THE PROLIFERATION OF TRYPANOSOMES IN THE ORGANS.

These observations were carried out on rabbits infected with *Tryp. brucei*, in which animals the disease runs a rather protracted course, and but few parasites are to be found in the circulation, so that the estimation of the numbers found in the various organs is easy. The experimented animals were killed at various stages of the disease, and the blood and organs examined in the fresh state. In the case of the latter the tissue was triturated in physiological solution.

The results are given in a table, and the author concludes: That the parasite multiplies first at the seat of inoculation, the peritoneum—*e.g.*, showing this up to the tenth day after inoculation in this situation. The infection then extends to the blood, and it is at this stage that the parasites are most numerous. Soon the trypanosomes settle themselves in the testicles, orchitis being commonly observed. The lymphatic glands are invaded in their turn, and afterwards the cellular tissue, the skin, in œdematous patches, and the nasal mucous membrane.

In all these organs the parasites multiply progressively with the well-known organic troubles common in the disease, and correspond exactly with its clinical history; but the secretions, such as the semen, conjunctival pus, &c., remain free from parasites.

In the spleen, salivary glands, liver, kidneys, suprarenals, lungs, brain, spinal cord, lachrymal glands, thyroid, thymus, bone-marrow, and ovary examination give uniformly negative results, save on a single occasion in the two first mentioned organs.

In short, in the rabbit, *Tryp. brucei* may be more abundant in certain organs than in the blood, and these organs are precisely those which suffer from functional troubles and coarse lesions.

VARIATIONS IN THE ELEMENTS OF THE BLOOD IN NAGANA.

Goebel, Oswald, and Demoor, Albert, in the following issue of the same periodical, p. 137, confirm Van Durme's work on the rabbit by observations on the guinea-pig, in which death takes place in fourteen to twenty-five days.

The parasites make their appearance in the blood in three to six days, and at first the trypanosomes multiply rapidly, but this is followed by a diminution, succeeded by a second multiplication during the last two or three days before death.

During the remission the parasites are fairly numerous in the lymphatic glands and very abundant in the testicles, while none are to be found in the other organs.

This growth of the parasites is associated with a fall in the number of red corpuscles, which may be reduced to a third of their normal number, though there may be a slight increase for a few days before death.

The onset of the disease is marked by marked hypoleucocytosis, but at the end there may be a return to the normal, or even slight hyper-leucocytosis. The number of polynuclear corpuscles is directly proportional to that of the trypanosomes, while the lymphocytes are inversely proportional. The large mononuclear corpuscles become increasingly numerous to nearly the end of the case, and often contain inclusions, which are probably the remains of trypanosomes. There is no increase of eosinophil leucocytes.

"Boll. R. Acad. Med. de Genova," 1906, p. 15.

THE LESIONS PRODUCED BY TRYPANOSOMA BRUCEI IN THE EXPERIMENTAL INFECTION OF DOGS.

Massaglia, Alda, on "Sundry Observations on Experimental Trypanosomiasis, and on the Biology of the Trypanosomes," *ibid.*, p. 6.

The author continues his last year's study of the lesions caused by *Tryp. evansi* in mice, rats, and guinea-pigs by some researches on the infection of dogs with *Tryp. brucei*, and obtained similar results.

The most gravely affected organs are the kidneys, which show hæmorrhages into the cortical substance, albuminoid and vascular degeneration of the epithelium of the tubuli contorti, and Henle's loops, nuclear chromatolysis, and caryolysis. In short, subacute hæmorrhagic nephritis. The cortex of the suprarenals show indications of functional hyperactivity, the liver of subacute hepatitis with fatty degeneration. The adenoid tissue of the spleen is thickened, the splenic pulp shows abundant hæmorrhages, with infiltration of polynuclear leucocytes, while in the Malpighian bodies there is an increase of lymphocytes and large mononuclear white corpuscles.

Glandular enlargement of the lymphatic glands, with hæmorrhages and infiltration of lymphocytes.

The bone-marrow is deep red to the naked eye, and is in a state of marked hæmatopoietic hyperactivity, and contains all the elements of the blood. Leucocytic counts were made in two of the dogs, as well as in some of the guinea-pigs, rats and mice infected with *Tryp. evansi*.

During the course of the disease there is marked hyperleucocytosis at first of all classes of leucocyte, but later on the polynuclear cells decrease in number, while the lymphocytes become more numerous. Figures given for a dog and a guinea-pig: the lymphocytes formed three-fourths of the total, while the polynuclear cells were reduced to 3 per cent. The red corpuscles are reduced to one-third, but maintained a normal appearance. In the earlier period of an infection the trypanosomes stain easily, but are rather smaller than those of following swarms.

Transferred to cerebrospinal fluid or to dropsical or amniotic fluid, the trypanosomes live for a short time. An intercurrent microbic infection (*e.g.*, by streptococci) causes the trypanosomes to disappear from the blood. At the point of death the infected animals were lithæmic.

"C. R. Acad. Sciences," T. cxlii., p. 1229.

EXPERIMENTAL INFECTION WITH TRYPANOSOMA BRUCEI. DESTRUCTION OF THE PARASITES IN THE SPLEEN.

Rodet, A., and Vallet, G., draw attention to the enormous destruction of trypanosomes in the spleen of dogs and rats infected with *nagana*, and carefully describe the various stages of the parasites met with in the spleen pulp.

They consider that the breaking up of the trypanosomes is an extracellular process, whereas it may be remembered that Sauerbech, who studied this question by sectionising the affected tissues, shows that the destructive process takes place in the interior of the macrophages. The spleen juice of healthy dogs has a certain amount of destructive power over these parasites, and the same is true of the lymphatic glands, lymphoid tissue of the intestine, and the circulating blood.

M. Mesnil, commenting on his abstract in the *Bulletin de l'Institut Pasteur*, believes that the present authors have fallen into error, owing to their employing the defective method of smearing, instead of that of sectionising.

"C. R. Acad. Sciences," T. cxliii., p. 135.

THE TEMPORARY DISAPPEARANCE OF NAGANA TRYPANOSOMES IN INFECTED DOGS.

Roux, Gabriel, and Lacomme, Leon. Starting with Rodet and Vallet's demonstration of the destructive effects of the spleen on trypanosomes, the authors tried treating infected dogs with inoculations of ox spleen extract (spleen ground up, by means of Latapie's apparatus, with three times its bulk of physiological solution) in doses of 20 cc.

Three dogs were experimented upon. In two injected subcutaneously phagædenic staphylococcus abscess resulted, while the third, treated by intravenous injection, showed no local ill-effects.

In all three, however, the trypanosomes disappeared from the blood, but followed by relapse in the first dog after seven days, while the others had not been followed long enough at the date of publication.

While admitting the possibility of the disappearance of the trypanosomes may be connected with the supervention of the abscess, the authors prefer to believe it to be the direct result of the spleen extract. The entire publication, however, seems to be premature.

"C. R. Soc. Biologie," T. lx., p. 1065.

THE SIGNIFICANCE OF EXANTHEMATA IN TRYPANOSOME FEVER.

Nattan-Larrier, L., and Tanon. An European patient, from the Upper Congo, exhibited a vesiculo-papular rash on the arms and thorax, and a circinate erythema on the shoulder, hypochondria on the epigastrum, axillæ, and lumbar region, appearing in simultaneous crops and running their course in ten to fifteen days.

Smears of the fluid obtained by scarifying the patches of erythema showed numbers of trypanosomes, while none could be found in blood from the finger. Erythematous patches of the sort are, therefore, of importance in the diagnosis of such cases.

"C. R. Acad. Sciences," T. cxlii., p. 1482.

THE IDENTIFICATION OF THE PATHOGENIC TRYPANOSOMES. ATTEMPTS AT SERUM DIAGNOSIS.

Laveran and Mesnil. The material employed was the serum of three goats, the first of which had been cured of Zululand *nagana*; the second, first of *nagana*, and then of Indian *surra*; and the third, first of Mauritius *surra*, and then of the *nha-trang* of Annam.

In like case, the mixture of virus which will cure a goat with a variable quantity of the serum of that goat ($\frac{1}{10}$ to $\frac{1}{2}$ cc.) is harmless to mice. The authors have tried to ascertain how these serums react on other forms of virus, so as, if possible, to base on this a method of serum diagnosis for the different trypanosomiases.

With some reserves, they conclude: (1) That the trypanosomiasis of Annam differs from that of India. (2) That the strong virus of the *Togo* of Marlini, which was unaffected by the serums of either of the three goats, is neither *nagana* nor *surra*. (3) That the virus of Schilling's *Togo* is not identical with nagana.

It may be noted that these serums were much less active when injected twenty-four hours previously, or at different parts of the body, though simultaneously, than if injected mixed with the virus.

"C. R. Acad. Sciences," T. cxlii., May 28, 1906.

THE RELATIONSHIP OF ANKYLOSTOMIASIS TO BERI-BERI.

Noc, F. The author found *Uncinaria americana* (Stiles) in 74 out of 77 cases of beri-beri, and in 17 out of 82 Annamites residing in contaminated localities, but never in any one of 31 Europeans suffering from various intestinal complaints. He believes that ankylostomiasis is an important factor in the etiology of beri-beri, and asserts that the administration of thymol effects a surprising improvement in such cases. Our readers may no doubt remember that the anæmia of coolies in the Assamese tea gardens was for a long period known as "beri-beri," until the disease was shown by Giles to be really ankylostomiasis. Have these cases of M. Noc any connection whatever with true beri-beri?

"Archives de Hyg. et Pathol. Exot.," T. i., 1905.

HUMAN TRYPANOSOMIASIS.

Kophe, Ayres. The author has met with fifty-two cases of sleeping sickness from the various East African Portuguese colonies, and has found *Tryp. gambiense* in all of them. For diagnosis he prefers to puncture a lymphatic gland.

In every one of forty lumbar punctures the parasites were found in the cerebro-spinal fluid, even when no nervous symptoms were present, and the characteristic leucocytic perivascular infiltrations of the nerve centres were found in all of the thirty-six *post-mortem* examinations made by him. *Glossinæ* (*palpalis*, *longipalpis*, *wellmani*) were found in most localities where the disease exists. In only one out of thirty-four cases did the cerebro-spinal fluid yield any organisms when incubated on a variety of media. In this instance a diplostreptococcus was found, but M. Kophe nevertheless found this organism in half his autopsies.

No animal experimented on showed the characteristic perivascular lesions, though dog-faced apes and other monkeys were tried, and no better success attended inoculations of the diplostreptococcus, whether the animals were already infected with trypanosomiasis or not. Twelve patients were treated; arseniate of soda, in combination with trypanroth, was tried on two, but was found useless, and afterwards atoxyl was used exclusively, 10 to 15 cc. of a 10 per cent.

solution, every eight to ten days, being well borne. Under this treatment there was obvious improvement, the trypanosomes disappearing from the blood and lymphatic glands, though they persisted in the cerebro-spinal fluid.

The author explains this by the impermeability of the meninges, instancing the fact that he failed to find any iodide of potassium in the cerebro-spinal fluid of patients who were taking that drug. Sooner or later, however, all his cases succumbed. In one case atoxyl was injected into the arachnoid, but the case was already moribund. An inoculation of 10 per cent. lysol was well borne, and no trypanosomes were found after in the fluid drawn by lumbar puncture.

"Arch. Inst. Bacteriol., Camora Pestana," T. i., p. 171.

EXPERIMENTAL TREATMENT OF TRYPANOSOMIASIS.

Magalhœs, A. de. The author tried arsenious acid, followed after forty-eight hours by trypanroth, on a number of infected rats, but with little or no success.

"Ann. Soc. de Méd. de Gaud," T. xxxvi., p. 52.

TRIALS OF RADIOTHERAPY IN EXPERIMENTAL TRYPANOSOMIASIS.

Nobelle, De, and Goebel. Their results were absolutely negative. (The Röntgen rays were employed.)

"Deutsch. Arch. f. Klin. Medecin," T. lxxxvii., p. 98.

THE TREATMENT OF PROTOZOAL DISEASES BY CONCENTRATED LIGHT.

Busck, G., and Tappheimer, V. It is well known that a variety of colouring matters so modify the action of light as to enable it to rapidly destroy living cells, and it was hoped, by first injecting such a colouring agent and then using concentrated light, that blood protozoa, such as trypanosomes, might be destroyed. With the exception, however, of eosine and erythrosine, all the dyes used were so rapidly decomposed in the blood as to be useless, and though trypanosomes and paramœcia immersed in serum so coloured were rapidly killed *in vitro*, the results of the authors' experiments on living animals were not sufficiently encouraging to lead them to hope much from this form of treatment.

"Preliminary Report of the Commission on Anæmia in Porto Rico."

Between March and November, 1905, 18,865 cases of ankylostomiasis were observed, the great majority of which were whites or mullatoes; but though the negroes were less frequently attacked than the whites, and appeared to suffer less in proportion to the degree of infection, many serious cases were to be met with among them. The annual death-rate from the disease is from 5,000 to 7,000.

The belief is expressed that in 99 per cent. of those harbouring the parasite (*Uncinaria americana*, Stiles) the infection has been contracted by the skin. Ground-itch (*magamorra*) is the first symptom of infection, and ankylostomiasis follows. Ninety-six per cent. of the cases of anæmia, in fact, stated that they had suffered from ground-itch, whilst among the healthy who had so suffered half had had the skin disease so long ago that the intestinal parasites might have been voided. The disease is specially rife in the coffee plantations, the work on which is mainly done during the rains. The Commission recommend treatment with thymol, five doses of which is sufficient to effect a cure, and their results are already remarkably encouraging.

"Le Caducée," September 15, 1905.

TEMPORARY DISAPPEARANCE OF TRYPANOSOMES IN DOGS INFECTED WITH NAGANA.

Roux, G. and Lacomme, L. In a paper read at a meeting of the "Académie" on May 28th, 1906, Rodet and Vallet described a series of experiments which showed that, in animals infected with nagana, the spleen is an active centre of destruction of trypanosomes; furthermore, *in vitro*, the spleen appeared to have a *trypanolytic action*. This suggested to Roux and Lacomme the following experiments, which were made with an emulsion of bullock's spleen:—

Three dogs were inoculated with *Trypanosoma brucei*; in from six to eight days trypanosomes were freely present in the circulation. The following day they were given 20 cc. of spleen emulsion; in from two to three days afterwards trypanosomes could no longer be detected, but in one of the dogs, in which a phagædenic abscess developed, they reappeared after an interval of five days.

This phenomenon of the temporary disappearance of trypanosomes in the blood of dogs infected with nagana, after the latter had received an injection of spleen emulsion, is an entirely new one, but one consistent with the prior observations of Rodet and Vallet, who had demonstrated the trypanolytic action of the spleen. This suggests the possibility of being able, by repeated subjections of spleen emulsion, to cause a final disappearance of trypanosomes from the blood of infected dogs.

The spleen emulsion is thus prepared: Take a fresh bullock spleen immediately after the death of the animal, if possible; triturate it in a Latapie crusher, dilute the product in a sterilised salt solution (7 in 1,000) in the following proportions: salt solution 3 parts, spleen 1 part; centrifugalise the emulsion, and inject the supernatant fluid either under the skin, or, preferably, into the saphena vein.—J. E. N.

"Bull. et Mém. Soc. Centr. Vétér.," T. lxxxiii., p. 363.

Lignières, L., records an instance of the infection of a dog with *nagana* in a fight with an infected coati.

"Journ. de Med. et de Chir. Prat."

TREATMENT OF MOSQUITO BITES.

Joly suggests the following mixture for allaying the irritation of mosquito bites:—

℞	Liq. formaldehyd (40 per cent.) ...	ʒiv.
	Xylol	ʒiss.
	Acetoni	ʒi.
	Balsam canaden.	gr. xv.
	Ol. citronellæ	q.s.

Before applying, shake the mixture, and touch the bitten part with end of the wetted cork or small piece of cotton-wool, and then allow the fluid to dry on the skin.

"The Liverpool Medico-Chirurgical Journal," No. 50, July, 1906.

TROPICAL ABSCESS OF THE LIVER.

Newbolt, G. P., reports eight cases of liver abscess which he had operated upon. Four were single abscesses, and all recovered; four were multiple abscesses, and all died. The operation favoured by Newbolt is incision and free opening up of the abscess cavity, but he states that in a deep abscess, with a good deal of liver substance intervening, a special trocar and cannula is possibly of benefit in order to avoid hæmorrhage. In places in the Tropics also, where surgical assistance is unobtainable and the operation has to be conducted single-handed, the simpler operation by the trocar and cannula is commendable. Of the many points raised by Mr. Newbolt, the following are the more important: (1) In all the cases seen by him a history of dysentery has been obtained. (2) Acute hepatitis, leading to abscess of the liver, is due to micro-organisms entering the liver from the intestine by way of the lymphatics, blood-vessels, or biliary channels. (3) An hepatic abscess may present acute signs and symptoms at first, passing on to a more or less chronic form, in which the patient may get about, the presence of pus being completely or for the most part masked. (4) Of the many complications and sequelæ, a suppurating hydatid cyst, an empyema, primary malignant disease of the liver with fever, syphilitic gummata, are the more prevalent, and difficult of diagnosis. (5) The differential diagnosis between

the rupture of a liver abscess through the diaphragm, causing empyema, and perforation of a duodenal or pyloric ulcer attended by the formation of a sub-diaphragmatic abscess, and similarly, after perforating the diaphragm, causes empyema, is discussed by Mr. Newbolt, but nothing conclusive is established. (6) Tenderness over the appendix may or may not indicate that a collection of pus anywhere in right loin or right hypochondrium had its origin in the appendix itself. In some cases the pain in appendix was secondary to pus developed higher up the right flank, in others the pus from appendicitis invades the hepatic region. (7) The presence of *Amœbæ dysenteriæ* in hepatic pus may or may not be an etiological factor in the disease. (8) Stitching the liver to the abdominal wall is, as a rule, impossible; when the liver is exposed, the area around should be packed with gauze, and the abscess remain unopened until four days subsequently.

"Journal of Economic Biology," 1906, vol. I., part ii.

THE EFFECTS OF METAZOAN PARASITES ON THEIR HOSTS.

Shipley, A. E., and Fearensides, E. G., of Cambridge, have studied the effect metazoan parasites exercise on their host from four standpoints: (1) By the mere presence of the parasite in some organ in which it takes up a certain amount of space and displaces a certain amount of tissue. (2) By the migration of parasitic organisms from one part of the body to another. (3) By the loss to the host, which has to feed the parasite, either on the half-digested contents of its alimentary canal or on its more elaborated fluids. (4) By the presence of certain toxins said to be given off by the body of the parasite, either as excretions or otherwise.

They found that metazoan parasites give off toxins which profoundly affect the tissues of their hosts. The fact of an association of a marked eosinophilia with the presence of parasites in the body seem to be a conclusive proof that toxins are given off in considerable quantities by all the better known human metazoa.

"Medical Record," August 18, 1906.

TREATMENT OF CHOLERA BY HYDROCHLORIC ACID.

Palier, E., suggests as a prophylactic against cholera liberal doses of hydrochloric acid with the addition of perhaps pepsin. For the treatment of the disease he recommends washing out the stomach with a 2 per 1,000 of hydrochloric acid in boiled water, and rectal irrigation by 1 per 1,000 of the same acid.

"American Journal of Medical Sciences," August, 1906.

A NEW INTESTINAL PARASITE OF MAN: PARAMŒBA EILHARDIA HOMINIS.

Craig, C. F., of the United States Army, found in the fæces of six natives of the Philippines a parasite not hitherto described. Watery stools with occasionally small amounts of mucus and blood constitute the prominent signs. *Entamœbæ dysenteriæ* were present in all the cases, and *Trichomonas intestinalis* in one case. The parasite appears to pass through an amœbic and a flagellate stage of development.

"Philippines Bureau of Health Report," September, 1904, to September, 1905.

X-RAY TREATMENT OF LEPROSY IN THE PHILIPPINES.

Wilkinson, H. B., states that of 13 cases of leprosy treated by X-rays, 3 have been cured, 7 improved, and 3 not improved. Dr. Wilkinson's theory as to the reason for cure by X-ray treatment is that the leprous bacilli are killed by exposure to the rays, and that their dead bodies are absorbed into the system, and render the persons thereby immune against the living organisms, just as injection of dead bacilli lead to immunisation in plague.

In support of this theory Wilkinson cites the following facts:—

(1) The treatment of one leprous spot on a patient produces improvement in spots at a distance from the one actually treated.

(2) The cure in the distant spots seems to progress parallel to, and to be just as complete as in the one treated.

(3) The best results seem to be obtained only when treatment is pushed to the point of killing or beginning to kill the tissues, which would also probably be to the point of killing the organisms.

(4) Cases in which there are massive localised leprous deposits are most rapidly improved. As in these cases we have an abundant culture on which to operate, and thereby produce immunity more rapidly.

(5) In diffuse general involvement of slight degree or atrophic character where there are only a few scattered organisms we have had little success.

(6) In two well-advanced cases, where the amount of new leprotic tissue was excessively great, the improvement was marked and rapid, but followed by loss of general health and rapid physical decline. This may be an over-dosage, so to speak.

"Journal Royal Army Medical Corps," August, 1906.

MALARIAL FEVER CONTRACTED IN PORTSMOUTH, ENGLAND.

Copeland, Major R. T., and Smith, Major F., D.S.O., report a case of malarial fever in a soldier belonging to the Royal Garrison Artillery, who developed typical tertian ague, whose blood showed abundance of tertian parasites, and in whom the spleen was enlarged. The fever disappeared when quinine was given. The soldier had never been out of England, and the question of infection was diligently enquired into. In the first place, no mosquitoes were found in the barracks (Clarence) in which the soldier was quartered, nor were there any breeding places for mosquitoes near by. A source of infection may have been a fellow soldier, home from abroad, suffering from tertian fever, who was quartered in the same room. The soldier's father lived at Carisbrooke, in the Isle of Wight; he had been in India twenty-four years ago, but according to his statement, he never had fever. Eight days after visiting his father the soldier developed malarial fever; it is unlikely—not to say impossible—that the father could have given the infection to his son; infection was probably conveyed from the comrade in the same room in barracks. By what means the infection was conveyed is a question. Majors Copeland and Smith state that infection by a mosquito was impossible, as no mosquitoes were in the neighbourhood, and suggest carriage by flea or bug.

The case is interesting, but the solution of the mode of infection is, unfortunately, not accurately determinable.

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THE PRINCIPLES OF DIET IN TROPICAL CAMPAIGNS.

By Andrew Duncan, M.D., B.S.(Lond.), M.R.C.P., F.R.C.S.
Fellow of King's College; Lieut.-Colonel I.M.S. (retired).

The subject of the food to be supplied to our men in tropical campaigns has to be considered under many heads, amongst which may be mentioned the amount to be given, its variation, its qualification by a hot climate, and the causation of disease by food.

Relation of the Elements of Food to Work and Heat.—Formerly Liebig's theory held good, namely, that the albuminates of the food supplied the force, whilst the non-nitrogenous elements simply served for the production of heat. Lyon Playfair also stated that the transformation of the nitrogenous food in the body was sufficient to account for all the mechanical force without holding that the fats and starches had any share in it. But subsequently physiologists showed that the amount of nitrogen excreted during rest is nearly the same as that excreted during work. The view now generally held is that stated by Fick and Wislicenus, who compare a bundle of muscular fibre to a machine consisting of albuminous material, just as a steam engine is made of metal. Coal is burnt in the latter to produce force, carbonaceous matter is consumed in the muscular machine for a like purpose. Again, as the iron of the engine is worn away and oxidised, so is the muscle also worn away. Much more coal would be burnt in the steam engine with heavy than with trifling work; all forms of energy of the body are derived from the non-nitrogenous elements, hence, during increased work, an increase in the non-nitrogenous elements is required; but as there is also, as in the case of the steam engine, some wear and tear of the body, so it is requisite to supply an increase of nitrogenous material during this increased work.

Amount of Food in Campaigns.—The amount of food consumed must be estimated with regard to the amount of work the soldier has to perform. A fair day's work for an average man is held to equal about 300 foot tons per diem, a hard day's work about 550 foot tons. A march of 10 miles, in heavy marching order, equals 250 foot tons. But on service the soldier has much more work than his mere march; he has his fatigue duties in camp; there are, in fact, numerous additional occasions for more bodily and mental waste, and very likely the quality of the food supplied is not so good as in peace. Hence, De Chaumont laid down that a war diet should provide for a minimum of 350 to 400 foot tons, and be capable of being increased at the shortest notice to 500 foot tons. Such an amount would be furnished by a diet supplying—

Nitrogen	...	350 grains.
Carbon ...	...	5,500 ,,
Salts ...	...	450 ,,

whilst the increased number of foot tons would require—

Nitrogen	...	450 grains.
Carbon ...	...	6,500 ,,
Salts ...	...	500 ,,

Climatic Qualifications.—The income of food in the body results in an outcome of bodily movement and of heat, $\frac{1}{5}$ to $\frac{1}{6}$ being expended as mechanical force, and $\frac{4}{5}$ to $\frac{5}{6}$ as heat. With the increase of external heat Kering and Funke have shown that less production of body heat takes place. Hence, inasmuch as less heat is required to be produced in a hot climate, it would appear that less heat-producing material is required. Dr. Carpenter has shown that in very active work in hot climates the necessary temperature of the body is maintained by such active work. Again, in campaigns the first affections to appear in the men are those of the digestive system, whilst it is well known that in the East the more nearly the diet of the European is assimilated to that of the native, in the substitution of fruits and farinaceous substances for oleaginous articles, the less will be the liability to disordered digestion. Professor Maclean, of Netley, in this respect, used to warn his class never to eat meat more than once a day. Dr. Crawford held that in the Tropics the meat should be reduced and the vegetable increased. Mr. Stanley, the African explorer, testified against "gratifying the seemingly uncontrollable and ever-famished lust for animal food." Hence, in the Tropics, in peace time at any rate, the food of the soldier should contain a large proportion of fresh vegetable and less animal food. But with the onset of a campaign we have the entrance of the factor of excessive work. Is, then, the *regime* of peace in hot climates to be followed out in war? Speaking personally, a diminished desire for animal food and fat in the hot weather was experienced when *stationary* in any of the camps on the line of communication, but when *marching* no such feeling arose. Hence, it would appear that during *active* operations in a campaign in hot climates an extra meat ration is indicated; this was ordered in Lord Roberts' great Cabul-Candahar march and was fully enjoyed, nor did it lead to any digestive disorders. In the *resting* stage of a tropical campaign let animal food be in part substituted by vegetable, let the fats be diminished, the carbonaceous elements being furnished rather by the starches. In the *marching and fighting* stages, on the contrary, let the animal food resume its wonted proportion.

The above general principles should be conjoined with the following considerations: First, at the commencement of a campaign the ration must be *ample*. In the Egyptian operations of war in 1882 the men had to be fed for the first four days on preserved rations, a proceeding fraught with danger. Secondly, the food should be *varied*. Digestion is never so likely to be upset as when there is a monotonous diet. A good example of this was afforded during the first four weeks of the Abyssinian War, where the food was restricted to beef and flour with no vegetables. Bowel complaints immediately begin to be rife. The necessary variation may be obtained by the issue of the different tinned meats from Australia and New Zealand, but the greatest caution must be exercised in this particular. No tin should ever be passed which is blown out. As regards vegetables, compressed should never be used; they are tasteless and stringy and set up diarrhœa by their irritating mechanical properties; they have lost their albumen

and salts, and consist chiefly only of the cellulose frame work. They were universally condemned in the Chitral campaign, causing diarrhœa, and were, moreover, scarcely eatable unless soaked for twelve hours. It is also always preferable to drive cattle with the force, rather than to carry meat supplies. Lastly, never give salted and preserved rations at a stretch, or, in fact, never, if possible, let the men undergoing severe exertion have only tinned meat for more than one day.

With regard to the question of *alcohol*, there should be, of course, no daily ration of rum, but total abstinence is to be avoided. There are occasions when a ration of alcohol has proved to be of the greatest value, such as when the men arrive in camp drenched with a tropical shower, tired out, and with no change of clothes. But if possible, light red wines should be issued twice or thrice a week; these are grateful and refreshing in a hot climate, and greatly preservative against bowel complaints and cholera. Mr. Stanley recommended strongly their use. Where renewed exertion is required after a long march, a ration of rum is beneficial, as was shown in many campaigns, *e.g.*, the Ashanti, the Galeaka-Gaika, the Eastern Soudan, &c. Lastly, alcohol, in the shape of a rum ration, is contra-indicated in all cases where bowel complaints, enteric, cholera and other zymotic diseases are likely to occur.

Preserved Foods in War.—Several varieties of these are on the market. In the African War, Kopf's Consolidated Soups were used and answered admirably. Whitehead's Variegated Soups were much liked. The most satisfactory of all was "Erbswurst," for it was highly nutritious and most easily prepared. A packet of this portable soup can be issued when it is impracticable to supply a full meat ration; in Lord Roberts' march each soldier had half a tin before starting the day's march. Maconachi's field ration was found to be excellent in Ashanti, in Egypt, in the Soudan, and in the South African Wars.

Scurvy in Tropical Campaigns.—Now that this disease has disappeared from our Mercantile Marine, owing to the ships carrying lime juice with them, scurvy probably is most frequently seen in India, especially on the N.W. frontier. Lime juice should always be part of the ration of war. I well remember being a member of a Committee on a certain regiment in Afghanistan, which had to be sent back on account of the severe outbreak of scurvy attacking it, fully one half of the men showing signs of the affection. In the China War of 1860, in Looshai 1871, in Suakim in 1885, there were outbreaks of scurvy, no lime juice being in the ration, whereas where this was given, as in the New Zealand War of 1863-65, in Ashanti in 1873, in Duffla, 1874, in Malay and Sunghi-Ujong, 1874-76, in Zulu, 1879, in Egypt, 1882, in Aka, 1883-84, in Dongola, 1886, amongst other campaigns, no scurvy appeared.

In recent wars, jam has been supplied to the soldier, this also, besides its anti-prophylactic value, is of good effect in counteracting the onset of fatigue by reason of the sugar it contains. Vaughan Harley has shown that 3,000 grains of sugar added to a small diet, increased the work done in the proportion of 6 to 39 per cent., whilst 3,700 grains added to a full meal, with eight hours a day labour, increased the work accomplished by 22 to 36 per cent. Should lime juice not be present with the force, what other means have we? My friend, Surgeon-Major G. Griffith, when P.M.O. of the Suakim Field Force, stopped an outbreak by recommending the men to eat their rations from the animal directly it was killed. The late Professor Parkes also recommended that in lieu of common salt, bitartrate of potassium should be taken at meals. This was given with marked benefit to the 21st P. I., during their return from Abyssinia, when scurvy attacked them on board the transport. Lastly, on the occurrence of four cases of scurvy in the Mountain Battery to which I was attached in Affghanistan, I recommended a daily ration of vinegar, as we had no lime juice, and no further cases came into hospital.

In conclusion, to illustrate some of the above remarks, I now give the scale of diet allowed to us in Afghanistan :—

Fresh meat (exclusive of bone)	1 lb.
Bread	1¼ lb.
Biscuit	1 lb.
Rice or flour	4 oz.
Sugar	3 oz.
Tea	¾ oz.
Salt	⅔ oz.
Green vegetables when procurable	6 oz.
Potatoes	12 oz.
Dhall	1 oz.
Rum	1 dram.
Tobacco	½-¾ lb. per month.

During the march to Candahar the meat ration was increased to 1½ lb. and 1 tin Kopf given daily.

The diet gave roughly :—

Nitrogen	428 grains.
Carbon	5,298 ,,
Salt	346 ,,

The chief remark to be made concerning the diet is that the amount of carbon was too small and this was also shown in the increased diet for the Cabul Candahar march, for the only factor that distressed the men and officers was *fatigue*, the amount of carbon being 5,702 grains instead of 6,500 grains. To ensure a proper amount of carbon in the diet, cheese, in which the proportion of N. to C. is 1 : 7 should be added to the diet. Bacon is also an excellent article of diet to work on, the proportion of N. to C. being as 1 in 24, or porridge, the proportion being as 1 in 21.

FOOD OF THE NATIVES OF INDIA.

By Major G. H. Fink, I.M.S. (Retd.), M.R.C.S.(Eng.), L.S.A.(Lond.).

The subject of food of the natives of India, though a very wide one, is of interest from a physiological, chemical and economic point of view. It is almost imperative that medical men should study the food, its constituents, and the elementary or proximate principles in India if practising either in the great cities, or the Mofussil, as the country districts are termed.

We are told that "the enumeration and classification of the food or aliments necessary to maintain human life in its most perfect state have been usually based

in the deduction of Prout, that milk contains all the necessary aliments and in the best form."

Wherever you go in India, you will find that there is great value set on milk and its products; also on sweetmeats and sugar, by the Hindu population, from the upper classes down to the labourer. The cow is worshipped by the Hindu as sacred, because of both food and drink which it provides for human life. The Hindus boil their milk for a considerable time before drinking it, and they sweeten it very largely with quantities of either white or brown sugar, according to the taste.

There are three principal products derived from milk which the Hindus use, viz:—(*a*) Dhyé (sour milk after lactic acid fermentation has set in) which they take with sugar; and the poorer classes take it with the rice left over from the previous night's meal, and sweeten it with sugar. This is the first meal very often before going to their work, which is their breakfast. (*b*) Malié or cream, which is also eaten with sugar, or made into sweetmeats, which the middle classes—who are unable to return to the midday meal owing to business or duties in Government offices—consume as their lunch or *tiffin*, together with other sweatmeats. (*c*) Chhanah, or a firmly set curds resembling cream cheese, which is also made into square cakes soaked in syrup, and used as sweetmeats. (*d*) Clarified butter or *ghee*, which is used for cooking and frying all kinds of food. I need hardly discuss the value of each of these articles, which are well known to medical men, now that I have described them. In considering the diet of the natives of India one has to divide the diet of the Hindus and of the Mahomedans respectively; then subdivide each of these according to their *status* and wealth; and last of all consider the various castes, and caste prejudices of the former, since meat or flesh is allowed in the case of some, but withheld from others, owing to caste.

It is erroneous to suppose that the whole of the natives of India are vegetarians, in the strictest sense of the term. This idea seems to have gained acceptance from the fact, that the wants of the natives, chiefly the Hindu population, are few and simple, and that they confine themselves to the actual necessities of life in the matter of food. Also, because rice, pulse, flour for bread, vegetables and fruit are largely consumed. Rice and flour are the staple articles in use as food, because rice grows plentifully in some parts of India, and flour in others, and according to the one or the other being plentiful, so the people, whether Hindus or Mahomedans, use it, because it is cheap and meets their requirements and their purse. Pulse or dhâl is most generally used throughout India. It is a form of lentils, and is most nourishing, sustaining and fattening. There are several kinds—*moong, musoor, arhar and chânâ*. *Moong* is considered the best but is more expensive than the others. It is a most appetising diet when made properly, and is usually served up with boiled rice or chappaties (flour cakes of unleavened bread). The labouring classes throughout India have this as a daily food with either rice or chappaties, according to the district or province growing rice or wheat plentifully. In Bengal proper, and Assam, rice is consumed more largely, while in Upper India, flour. Among the better and the wealthier classes in Bengal and Assam, in addition to the above articles mentioned (rice and dhâl), fish, of various kinds, which is easily digested and contains a deal of phosphorous, is cooked as a curry in oil (the expressed mustard oil), and there is generally a vegetable curry also served up at the midday or the evening meal. Hilsah and Bekty fish are the best kinds used, and the former contains a deal of fatty matter, and in value is equivalent to mackerel, if not higher in its proportion of nitrogen. Some cheaper forms of fish are used by the rich as well as the poor, fish being very plentiful, as a rule. Mutton is also permitted to be eaten by Hindus, but in Bengal and Assam fish is preferred, owing to its properties being valuable for brain workers, and, being easily digested, is a suitable form of diet for those who lead a sedentary life.

Among the Mahomedan population, wherever you see them, they consume more flesh than the Hindus, and are permitted to eat either fish, fowl, mutton or beef. Even the poorer class of Mahomedans eat more animal food than the Hindus, but in some parts of India, Hindus are quite as strong on animal food (mutton and fish) as Mahomedans. The strictest vegetarians are the *Jains*, a sect of which a great many of the mercantile caste of Upper India are members. They abhor the taking of life in any form, and many of the strictest among them will eat their last meal before candle light, because the flame attracts insects and destroys them. "Jainism," we are told, "is one of the most important of the living cults among Hindus. It is professed by at least a million men, and some of these are among the wealthiest and most refined in the Hindu community."

Leaving Bengal and Upper India, we have to consider Bombay, Madras and the Central provinces. As to the consumption of rice and flour, respectively, by the inhabitants of these provinces, they follow much the same rule in the matter of *status* and *caste* as in Bengal and Upper India in the choice of their staple food, and the various additional articles of flesh, fish, vegetables and fruit, as well as pulse.

Ghi, or clarified butter, is an article of diet which both Hindus and Mahomedans of all classes believe strongly in as possessing valuable nutritive properties, and cannot be dispensed with in cooking their food as well as their sweetmeats of certain kinds, which need frying lightly or smearing over the surface with, to give it a flavour. The poorer classes in Bengal and Assam who cannot afford *ghi* (which is about one rupee the *sir* = 2 pounds), use *expressed mustard oil*, which is also valuable and goes a longer way than ghi. Expressed mustard oil is always used for cooking fish in, and as an inunction among the Hindus, who smear their children's bodies with it from the day of their birth, and later on in life use it over their hair, since it is supposed to have the excellent property of keeping away colds and catarrh, and this has been greatly proved by experienced and mature doctors in the country to be the fact.

I think, with regard to Madras, Bombay and the Central Provinces in the matter of food, Madras, which is adjacent to Bengal, in a large measure is similar in the consumption of the various articles of food in use among Hindus and Mahomedans respect-

ively. The Madrasis, of whom a large number are Roman Catholics, live very similarly to the way their masters live in the matter of food. Bombay holds a mid position between Bengal and Upper India; while the Central Provinces follow much the same line of diet as the United Provinces of Agra and Oudh, which is practically Upper India, including the Punjaub.

I have left the question of drink, and that of air, out of this paper on the food of the natives of India, although I must say that great stress is laid by the natives of many parts of India on the various kinds and qualities of water for drinking and cooking purposes, since some are supposed to aid digestion as well as easy cooking of their rice and pulse, while others retard digestion and cooking.

If we analyse the various kinds of food in use in India by the rich as well as the poor, we cannot help coming to the conclusion that, on the whole, the food is fairly well balanced in the matter of the elementary principles of the diet of both Hindus and Mahomedans. The Hindus, though largely vegetarians, live on food rich in carbo-hydrates and hydro-carbons; but they are, at the same time, large consumers of milk and those products of milk which are healthful and nourishing. In Bengal and Assam, fish supplies largely the nitrogenous element; while in other parts of India, fish and mutton are used. The Mahomedans, who form about the fifth of the total population of India, live on very similar food to the Hindus; eat less sweetmeats; but more animal food (mutton, beef and goat's flesh). Their food, on the whole, contains a larger proportion of the nitrogenous principle than that of the Hindus. The poorer classes of both Hindus and Mahomedans (except the hunting class and the wandering tribes, as well as the sweepers, who are the lowest menials in our household and eat the leavings of our food), as a whole, though contented and happy with their rice and flour with lentils, have some cause for complaint in the matter of luxuries which they can barely indulge in. In seasons of rich harvests or poor harvests, their lot remains the same, and they are not one bit better off nor worse off. It is only in times of famine and great scarcity of food that they have to fight hard against disease and death, and then their lot is a deplorably unhappy one, until relief comes through the Government. There is not the least doubt that within the last twenty-five to thirty, or more years, the price of food has risen, and the rate of wages accordingly of domestic servants, which naturally hits the better classes under Government pretty hard. Moreover, milk and ghi, which the Hindu population attach such great importance to as articles of food, have risen in price, owing to the supply not being up to the demand; but these are questions which are outside the trend of this paper, and therefore cannot be considered here.

In taking the question of the food of the natives of India into full consideration, there is not the least doubt, that, on the whole, it is the most suitable to the climate and their wants, and is a diet which is economical as well as scientific, because the nitrogenous and non-nitrogenous principles, and the mineral salts and vegetable acids, are in that proportion which suits their constitution. In Bengal proper, the carbo-hydrates and hydro-carbons consumed, are, I should say, somewhat in excess of the standard of health, among the better classes.

I have left the Parsi population of Bombay out of this paper, since their standard of living is more Western or European.

FOOD AND DIGESTION IN WARM CLIMATES.

By James Cantlie, M.B., F.R.C.S.

The Food of Natives of the Tropics.

We are usually told, and home-dwelling British folk believe, that the natives of the Tropics live on rice. During the Russo-Japanese War the newspapers, referring to the extraordinary exertions of the Japanese, stated, in reference to their diet, that all the hardships of the campaign were undergone by troops whose sustenance consisted of a handful of rice mixed with water. This misleading statement is in harmony with the rooted belief that the natives of the Tropics and sub-Tropics live on rice.

For China, the country best known to the writer, the same statement is believed to hold good. What are the facts? Every Chinese contractor engaged in any large undertaking knows that he can only get good work out of his men if he feeds them well. Their early morning meal consists of soft-boiled rice "conjee," but that is only the chota-hazra of the Indian. The forenoon meal, or breakfast, consists of fish, or fat pork, vegetables, rice and tea. The midday meal may be again soft-boiled rice, but the afternoon or evening meal consists also of fish, pork, vegetables, rice and tea. The rice is in no larger proportion to the meal, perhaps not quite so large, than is bread in the European breakfast. To say that the Chinaman lives on rice is, perhaps, not so near the truth as were we to state that the European lives on bread.

In almost every nation of the Eurasian continents, except in Britain, two main meals during the day, partaken in the forenoon and late afternoon, is the rule, so that the hours of diet and the kind of food is in China what is customary elsewhere. It is impossible to work, or even live on rice alone; it is impossible for soldiers, or for labourers, to continue for more than a day or two on rice alone and remain fit for duty. In British campaigns we know soldiers go for a day or two on a few hard biscuits, but three days of a biscuit diet, or even a bread diet, ends in collapse from semi-starvation. It is as true that British soldiers went through the South African Campaign on biscuits as it is to say the Japanese fought their arduous battles on rice. Yet does this insane belief, that the natives of tropical and of sub-tropical countries subsist on rice prevail, and the elimination of such nonsense seems impossible.

A Vegetable Diet.

Vegetarianism is a potent cult amongst a certain section of British town dwellers at present. It is regarded as if it were something new and advanced, and amongst what, for want of a better name, may be termed "cranks," vegetarianism is preached as if it were a new Gospel. "New" or "advanced" persons, be they men or women, amongst other fads affect

vegetarianism and regard an all vegetable diet as entitling them to be classed, with those types of degeneracy known, as "advanced" people. A so-called vegetable diet has been, and, it is hoped, will continue to be, the food of many stalwart people; it is nothing new; it is an all-sufficient and time-honoured means of sustenance, and is not the creation of modern minds. The belief that vegetarianism is a new cult is as true as that the natives of India and China live on rice; ignorance is the explanation of both beliefs, but the eradication of ignorance of this stamp appears an impossible task. The term vegetable diet is a misnomer for the most part, for it includes, as a rule, milk, eggs, and not infrequently butter and animal fats, in the form of dripping, &c., used in cooking. That one can subsist, thrive and work hard on this inclusive vegetable diet does not surely want to be told; in many countries we find it used. In the more northerly countries of Europe a diet similar to that consumed in the Eastern and North Eastern counties of Scotland amongst farm servants obtains. Take the diet of a farm servant in Scotland, at any rate, up to quite recently—Breakfast: oatmeal in the form of porridge with oatcakes and milk. Dinner: mashed potatoes or brose, *i.e.*, oatmeal with boiling water or hot milk poured over it and flavoured with vegetables, oatcakes and milk. Supper: cabbage, or kail, or potatoes, with oatcakes and milk. On Sunday: Broth made from beef bones or neck of mutton with vegetables. Beef or mutton was eaten only during a few days in the year—Christmas Day, New Year's Day, and perhaps on one or two other occasions. Theirs was a vegetable diet, and, with the exception of milk, an all vegetable diet. Yet did these men thrive and work hard on this diet, and were as good specimens physically as any in the land. This is, from some standpoints, a more meagre diet than that of the Chinaman, who is foolishly believed to live on rice, and it is more simple and more thoroughly vegetable than professed yclept vegetarians follow, who frequently include not only all the vegetable products of the Orient—sage, rice, tapioca, &c., but also eggs and milk. It is therefore untrue that vegetable eaters are found only in warm countries.

Varieties of Food.

Cow's Milk.—To home-dwelling Europeans it is incredible that milk is not used as an article of diet by people of every nationality. Several races, however, do not use milk in any form. The Chinese, and all other Mongolian peoples, constituting almost one-fourth of the entire population of the universe, do not drink milk, and several other races, especially the Malays of the Archipelago, follow their example. Babies in China, when weaned, are given the water rice is boiled in (Conjee), as we give milk to the children, and they thrive well upon it. In the districts of Scotland mentioned above, milk is (or was until quite recently), taken in larger quantity than by any other adult people in the world. The milk used is not the milk as it comes from the cow, with ten per cent. cream, but almost eight per cent. of the cream is removed by skimming (not separated), and the amount taken during the day would be between 2½ and 4 pints. It is doubtful if milk with the natural amount of cream could be taken in such quantities without making the consumer "liverish"; on the other hand, separated milk (quite different in quality to skimmed milk), would, in all probability, be insufficient to give the nutriment required. No other section of the human race consume milk to this extent, and as the Tropics are approached, cow's milk is less and less used. Goat's milk is substituted in some parts; ass's and mare's milk, either naturally or in a fermented state, is taken, and buffalo's milk is used by some peoples. Buffalo's milk contains a much larger proportion of cream, some seventeen to eighteen per cent., but the skimmed buffalo's milk is poor in food-giving properties compared with cow's.

Europeans in the Tropics, wherever possible, import European or American cows for milking purposes, owing to the native cows, in the far East, at any rate, not yielding the same quantity or quality. Tinned milk, especially Nestlé's, is largely used by Europeans in warm climates. Were it possible to issue Nestlé's milk in smaller tins, there is little fault to find with its use in the Tropics; but owing to the size of the tin sent out by the Company, the contents cannot be consumed in one day, and in a tin once opened the contents rapidly become quite hard in a dry climate, or in a warm, moist climate they are apt to become mouldy. Were it possible to export Nestlé's milk in smaller tins, so that the opened tin need not be kept from day to day, it would be a great gain hygienically; but it is doubtful if it could, under these circumstances, be exported at a sufficient profit without largely increasing the cost to the consumer.

Sterilised milk, *i.e.*, fluid milk sterilised before being put in bottles, as that known as Dahl's, is theoretically excellent, but the cost and the difficulty of transport are rather prohibitive for general and continued use.

On board ship the absence of fresh milk is greatly felt by invalids returning to temperate climates, and sterilised milk is, perhaps, the best substitute under the circumstances.

In England, milk as an article of food has well-nigh disappeared in many country districts. In the neighbourhood of all large towns the farmer is pledged by contract to sell to the milk-agent from the town all he produces. The farm is a "tied-farm" as much as a public-house in the hands of a brewer is a "tied-public-house." The country children have to get along as best they can without milk, and as bringing up children at the breast is going out of fashion amongst even the rural population, the children are under fed, and rickets is more common in country villages round London than in the city itself. The rural population of large parts of England at the present moment have the poorest diet of perhaps any peasantry in the world. Tea, bread, cabbage and occasionally potatoes, is their staple food, yet do the "educated classes" believe that in the Tropics the natives live on rice, whilst the "roast beef of Old England" for adults and milk for young people is the staple diet of all and sundry in the British Isles. Two-thirds of the rural population in England now-a-days taste beef perhaps once a month, and have milk, if at all, only in teaspoonfuls with tea.

This is not the place to expatiate on a people thus

placed; I have dealt with that elsewhere. The physical decline of a people with its rural population insufficiently and inappropriately fed is not far off.

Beef and Mutton.—It many parts of the Tropics fresh beef and mutton are unobtainable. Cattle may not be reared in the district, and imported cattle are usually employed as beasts of burden.

In out-of-the-way parts of the Tropics beef is wholly unobtainable; the population may be too small to consume, or too poor (as in many rural parts of Britain) to buy, sufficient of a freshly killed ox to make it pay to do so; this obtains not only in the Tropics, however, but in rural districts in Britain; so the "travellers' tales" on these points, although they amuse towns' folk in England, are true not only abroad but at home.

In the equatorial and the tropical zones north of the equator the consumption of beef by the natives is almost nil, and in the sub-tropical and northern regions it is seldom used. In southern sub-tropical countries—Australia, the Cape and South America, cattle grow and flourish, and the consumption of fresh meat, by Europeans especially, is as customary as amongst the better off classes in Britain.

Sheep are distributed very irregularly over the world, for in many parts it is impossible for sheep to live. It is not climate so much as food that is the determining factor, for in Southern China and in Japan where there are no sheep, it is the pasturage that is wanting. Fresh mutton and beef, therefore, is difficult to get in many parts, mainly owing to the environment being unsuited to the rearing and feeding of cattle and sheep, and partly from the inability of the people to buy imported meat.

Breeds of Cattle and Sheep.—It must be remembered that cattle are utilised very largely, not only in tropical but in some temperate countries, as beasts of burden. There are milk cows and draught oxen in the country it may be, but these are neither by a breed nor on account of their age when killed of a quality that produces wholesome and nutritious meat. In Britain, cattle are fed and killed at about two years of age, and from these and these only can the best beef be obtained; in most other European countries the breed of cattle is of inferior quality and do not reach a profitable killing age until one or two years later, necessitating thereby longer keep, that is, more expense and a higher charge for beef were they killed. The consequence is the farmer cannot afford to keep oxen for four years earning nothing, so he puts them to the plough and their muscles become so tough that their beef is leathery and affords but little nutriment.

It comes about, therefore, that cattle are either killed (except in Britain) as calves or allowed to reach the advanced age of ten or twelve or more years before being killed.

The reason that veal is used so commonly in France and Germany is attributable to this cause. Farmers cannot afford to allow the animal to attain full growth for market purposes as they have not the breed of cattle, nor have they the pasturage, turnips, &c., necessary to produce the highest class beef. Their animals when allowed to mature are utilised for farm work, and when killed their muscles are so tough that the beef requires all the tricks of the culinary art to render it fit for consumption. Hence the superiority of "continental" cooks compared with British cooks; the former find it necessary to disguise the poor quality of the meat, the latter are not ashamed to produce the beef as it is, culinary tricks being unnecessary.

The quality of mutton depends greatly on the breed of the sheep. In Australia the wool-producing sheep are more sought after than are the flesh-producing sheep grown in Britain. The quality of mutton, obtainable from sheep from which wool is most profitably grown, is quite inferior to the class bred and fed for killing purposes; and as the farmer keeps the wool-producing animal for as many years as possible, it comes about that, not only from the quality point of view, but also from that of the age of the animals when killed is the mutton inferior in nutriment. It is plain therefore, that beef and mutton may be good enough from the inspector's point of view, but may be tough to digest and wanting in nutritious properties. Such flesh appeases hunger, no doubt, but is not calculated to give bulk for bulk the same nutrition as a food. In this way many dietary peculiarities of tropical life may be explained. More meat has to be eaten to get the sustenance necessary when the meat is of inferior quality. This may be the reason for the accusation made against Europeans dwelling in the Tropics that they eat too much. Certain it is that most Europeans eat more meat (when they can get it) in the Tropics than at home. Some say it is because the climate is exhausting and more strengthening food is required; but the real reason, no doubt, is that the nutritive quality of the beef and mutton is inferior, and that more has to be taken to supply the bodily wants, thereby taxing the digestive organs, which in hot climates are usually feeble, and bringing a train of gastric, hepatic and intestinal troubles.

Frozen Meat.—Could frozen mutton be introduced into tropical countries, a great food problem would be solved. In large cities on the coast cold storage would allow of a plentiful supply of mutton, and perhaps beef, being available for residents in the town itself, but in up-country districts the introduction of chilled or frozen meat is, in the present state of our knowledge, impossible. Not that the sheep of Australia or New Zealand affords the highest quality of mutton, for they are chiefly reared for the wool they produce, and the carcass has, up to recent years, been a bye-product. Now, by freezing or chilling, the bye-product has a commercial value, although it never can be, from sheep of that breed, of the highest.

Fowls are generally distributed through the universe, and there are no parts of the world, so far as I know, where fowls cannot be found. The wide distribution of the fowl is an important factor in the spread of civilisation, for it is a question if Europeans could live in many of the out-of-the-way districts they do were it not that they can have eggs or fowls to eat. The nutritive value of chicken is relatively small, however, and is frequently difficult to digest; moreover the monotony of eating fowl day after day, and month after month, let the fowl be cooked in ever so many ways,

palls upon the appetite after a time, and digestion and nutrition suffer.

Curry, so largely used in tropical countries, is not only the staple form of diet of many natives, but is used also freely by the Europeans dwelling in warm countries. Rice is the basis of the dish, and with it is a congeries of materials, which may consist of fish, flesh, or fowl, with vegetable additions of sorts. The sauce (curry really means sauce, from the Tamil word *kari*) is composed of condiments varying in potency; ginger, pepper (white, black, or cayenne), and various spices give flavour and "nip" to the meal. The use of pepper is, of course, an Oriental custom, and the stronger forms of pepper seem requisite as an article of diet. The therapeutic use of pepper seems to be not so much a stomachic tonic as an intestinal stimulant, and chiefly as a stimulant to the large intestine. It is the large intestine that first flags in its duty in the case of the natives of tropical countries. Constipation is one of their chief complaints, and the atonic condition of the colon is the chief cause. Black pepper is a stimulant to the colon and rectum, and its extensive use in warm climates is physiologically justified by what has been proved by therapeutic investigation and the experience of centuries. Constipation is combated by the natives of warm climates by pepper and spices in the food, by castor oil occasionally, and largely by the position assumed during defæcation—the natural or squatting position. Our modern closet with its high seat is a great detriment to defæcation, especially in habitual constipation, and were people thus afflicted to resume the "natural" position a great deal of the suffering due to piles would be prevented. Some people overcome the difficulty by standing on the seat—an awkward and an indelicate proceeding. The use of a high stool for the feet in front of the closet seat will really give a position sufficiently "squatting" to overcome the difficulty. Curry, therefore, if properly made, is an hygienic dish of value; and should not be regarded with the suspicion it is looked upon in Britain, where badly cooked rice, particles of tough, twice-cooked meat left over from a three or four days' old joint, and made hot to blistering strength with curry powder is the rule. The rice and meat should be served in separate dishes and the condiments added by the consumer himself, or herself, at table, and not by the cook. According to the state of one's digestion so may condiments be added, the people with atonic intestines requiring a larger helping.

The Basis of Special Preparations.

It is impossible to deal categorically with each individual article issued by any particular firm. After all, it is the firm—the people who make the articles for consumption—to whom we have to look for protection in this matter. The show preparations of one firm may be as good as another, but the ordinary articles made to sell may be of quite another character. Given a firm that "can afford to be honest," and we have sufficient guarantee that the goods are what they pretend to be. Mistakes may be made, and faulty raw material may occasionally find its way into the manufactory, but in a firm with a good name to maintain, and not to lose, the public can rely that the materials employed are the best that can be obtained. Lately the American canned goods scandals have shaken the confidence of the public in all kinds of preserved foods. What was going on in American canning factories was well known to manufacturers of food products in this country, to all medical men, and to all who cared to listen to what was said and written. The warnings were disregarded, and British manufacturers were eclipsed in the market; now, perhaps, people will patronise the products of their own countrymen, where the materials used can be inspected, and the process of preparation watched. That British producers of foods of this description have taken infinite pains to ensure cleanliness of premises and wholesomeness of materials, is well known, and we look forward to still further improvement in this important department of food supply.

The basis, the "granulated powder," used by several manufacturers in this country is professedly obtained from America. This, perhaps, is commercially imperative, for it is impossible at the present price of beef-teas, essences, jellies, &c., in the market, that prime beef can be used in their manufacture. The "ox in a bottle" theory is all very well in the form of an advertisement to induce the public to buy the goods, but oxen in this couutry are not obtained for a few shillings, nor yet for a few pounds. An "ox in a bottle" would cost at least £25 instead of about as many pence at which it is sold. We would urge on manufacturers not to be afraid of price; beef is an expensive commodity, and its issue in the form of concentrated food will almost double its value, so that it is, and it must ever remain, expensive. The products at present in the market are much too cheap to command the serious attention of medical men, and we can assure the manufacturers that they will gain higher commendations from the medical profession upon their products, when they issue them at a price which even the most embryonic of financiers can appreciate to be necessary if the "basis" of the materials is obtained from the best beef.

Alcohol.—The natives of warm climates, both by their religion and their habits, shun alcohol. It is in no sense a food, and Europeans in the tropical countries would do well to avoid its use altogether.

Spirits and beer in hot, moist climates are positively detrimental to health; light wines, white or red, do least harm. Champagne, taken after excessive fatigue, about sunset, is perhaps the safest form of alcoholic beverage. It should not be taken with meals, but only on reaching home after a fatiguing march, or long exposure to wet.

Tea.—As a stomachic tonic, and as a safe way of introducing fluid to the system, tea would seem beneficient and hygienic. It was evidently introduced by the Chinese, owing to the calamities arising from drinking unboiled water. Deep well water is almost unknown in China, and the shallow wells and streams are so apt to become polluted, owing to the habits of the Chinese, that experience dictated the necessity of boiling the water. But, boiled water being insipid, and the object of its being boiled not being evident to ignorant and thoughtless people, the water was

"flavoured" by the leaves of the tea plant, a custom which has become widespread. It was, no doubt, for hygienic purposes tea was introduced, but the abuse of tea-drinking has brought many evils in its train. The Chinese drink tea after finishing their principal meal, and, in fact, as a drink at any time. They do not drink tea during their meal, but after the meal is finished. The pernicious system of drinking tea during a meal is one peculiar to British folk, and the habit is fraught with many dyspeptic troubles. The best China tea, prepared by pouring boiling water over the leaves and immediately pouring the water off the leaves, is a wholesome fluid, calculated to aid digestion, especially when taken after the meal is finished. Tea taken *with* animal food, be it eggs, fish, flesh or fowl, is a certain means of producing dyspepsia, for when the tea is "drawn" for a long time, and when the tea used is of an inferior quality—the method and material usual in Britain and Australia—the tannic acid of the decoction, uniting with the albumen of the animal tissues, produces a leathery compound which no gastric juice, however potent, can penetrate and digest. Tea used as the Chinese use it is a hygienic drink; as it is usually used in Britain and by British folk throughout the Empire it is detrimental to the public health.

Coffee.—Two or three mouthfuls of good coffee after a meal is an aid to digestion; taken in quantity, breakfast cupfuls, it is an impediment to digestion, and diluted with half milk and taken with a meal of eggs, fish, fowl, or flesh, is still more so.

Tobacco.—In moderation, and smoked soon after a meal, the deleterious effects of tobacco are infinitesimal. When indulged in to excess, say six to eight cigars, or fifteen to twenty cigarettes, or 1 oz. of pipe tobacco a day, especially in a moist, tropical climate, tobacco is an injurious cardiac depressant.

SPECIAL FOOD PREPARATIONS.

Beef Teas and Jellies; Chicken Soups and Jellies; Calves-foot Jelly.—Home-made beef-tea made from prime beef (top of the round) has the advantage that "we know what is in it." That, however, does not prove it to have nourishing properties. In fact, except as a stimulant from the salts it contains, it gives but a meagre nutriment to the system. Home-made beef essence is usually given in so concentrated a form that it frequently causes flatulence and discomfort. Of the many fluid beef extracts on the market, Bovril has for some time held the foremost place in popularity. It is used in the kitchen and in the sick-room; by the busy man of commerce and by the lounger in the club; by the soldier, the sailor, and the traveller, and in many remote parts of the earth it is highly prized. Whatever the nutrient value of Bovril, and other preparations of the kind, there can be no doubt they have contributed to advance temperance; for at public bars nowadays one of them is asked for instead of spirits or other alcoholic drinks. Tropical climates do not affect Bovril so long as it remains undiluted. Brand's Essence has long held a high place in public estimation, and is a favourite preparation in the sick-room. "Lemco" is the name recently adopted by the purveyors of the well-known Liebig extract for their preparation. All the world knew the famous extract prepared by Baron Liebig, but although the name has changed we are bound to say the quality of the preparation has not deteriorated. The extract is as good to-day as ever it was.

Chichester Brand preparations have been for a considerable number of years on the market, and they are not so widely known as they might and deserve to be. Shippam, of Chichester, manufactures these products, and those we have tried—the beef-tea and chicken jelly—are excellent, appetising, and easily digested.

Maconochie's preparations are pleasant to look at, agreeable to taste, and leave a sensation of cleanliness of the palate, very different to the mawkishness and burnt-beefy flavour which hangs about the mouth after some of the similar preparations in the market. The calves-foot jelly is specially good, and is relished by children; it possesses the great advantage of being ready for use. The essence of beef is a wholesome preparation. Messrs. Maconochie have endeavoured, and with success, to supply a compressed meat tablet, under the name of Vitox. The tablet is pleasant to taste, satisfying and sustaining, and contains as much nourishment as it is possible to get into so small a bulk. There are other well-known preparations of similar nature to the above, and most people have a preference for this or that jelly, extract, or essence. An apparent drawback to all these "solidifying" preparations is that they become fluid in warm climates. This is not really a drawback, as the nourishment is there all the same, and it means sipping fluid instead of jelly, but if one prefers them in a solid state, they may be put on ice, if available, or hung in a draught away from sunlight, or lowered in baskets down a well, where it is usually sufficiently cool to solidify most jellies.

Children's Food.—Of the many special preparations for infants' food, it is impossible to deal with at length. Several have been before the public for many years, and there is no fault to find with the majority of such preparations. Amongst those to be specially commended are: Neaves' Food for Infants—a carefully prepared and wholly hygienic product. The foods prepared by Savory and Moore and by Allen and Hanbury's firms have the guarantee of the names of these well-known and respected firms. The fault to be found with firms supplying food for infants is, that the majority of them pretend that artificially prepared infants' foods can, or do, take the place of milk, either in natural (human) or unnatural (cow's) form. Of special preparations for invalids and delicate people, Plasmon and Sanatogen hold deservedly high places in the public estimation. The former has been for some time in the market; Sanatogen is a more recent production, but one which has in cases of intestinal ailments such as typhoid, dysentery and sprue, become a favourite.

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THE

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THE PUBLIC AND THE FOOD TRADE.

THE recent gruesome disclosures of the secrets of the Chicago packing houses must have come as a rude shock to most dwellers in the Tropics, as few such can have read the articles that flooded the papers without having forced on them the disagreeable conviction that they had already largely overdrawn their account on the peck of dirt which proverbial philosophy places to the credit of every child born into the world.

In all our tropical possessions the old stager learns to utilise the resources of his adopted home, while the "griffin" may be known by his lavish expenditure on tinned "Europe stores," but there always remains a point beyond which local resources fail to meet the requirements of our European *ménu*, and to meet which, even the most seasoned veteran is driven to consume imported luxuries.

It is seldom that one can long follow the columns of our Indian dailies without meeting with a case of what is usually reported as "degchi poisoning."

The *batterie de cuisine* of the Indian cook is made up usually of copper vessels, so named, which are periodically tinned, and the gastric disturbances that are reported under the above title are popularly supposed to be due to metallic poisoning, owing to neglect to keep the cooking pots properly tinned.

Now the writer has never met with an instance in which this explanation has been verified by chemical examination of the dejecta; and it is a curious circumstance that most of these outbreaks occur after big dinner parties; on which occasions tinned delicacies always figure largely, forming as they do the Anglo-Indian's fatted calf. They are, in fact, cases of ptomaine poisoning.

In India it is quite possible to live comfortably without ever touching preserved food, but in some of our other tropical dependencies this is far from being the case. Notably, in West Africa, where from the Europoan point of view, local resources are so scanty as to leave the white population mainly dependent on preserved food.

It is practically impossible for the consumer to test the wholesomeness of articles preserved in tins, as the really dangerous changes are often imperceptible to the sense of taste, and do not result in the production of gases, so as to make the can convex at the ends, or "blown."

Food in an advanced stage of decomposition, such as that contained in a blown tin, is hardly likely to be eaten by any one, save under the compulsion of actual starvation, but, unfortunately, the consequences of eating the apparently sound articles may be far more serious than those which would result from eating the products of ordinary decompositions. It is now tolerably certain that scurvy is caused, not by want of certain vegetable acids, nor even by the lack of fresh food, in the ordinary sense of the word; but that it is due to the action of certain ptomaines which exist in a large proportion of preserved comestibles, such as salt beef, tinned goods, &c., and possibly even in stale grain.

The great Arctic explorer, Nansen, remarked with reference to an outbreak of scurvy among the men of a sledging party, who escaped starvation by utilising a store of provisions left, some years before, by some previous explorers, and who rejected the blown tins, that they would have been wiser to eat the obviously decomposed than the deceptively wholesome-tasting portions of the store, presumably under the assumption that the bacteria, which cause the subtle and dangerous changes, would be crowded out and exterminated, and their products destroyed, by those of ordinary decomposition.

Every Indian jail superintendent knows how hard it is to keep an Indian prison free from scurvy, in spite of most liberal rations of fresh vegetables, and of lime-juice. Now the only article of the prison diet which is preserved is the grain, which forms the bulk of the ration, and this is bought immediately after the harvest and stored, often in a very primitive manner, so that by the next harvest it is necessarily more or less stale. It would be interesting to ascertain if the incidence of scurvy in these institutions is seasonal.

Sponginess of the gums, such as is seen in Indian jail scurvy, is by no means uncommon among Europeans in West Africa, and it seems possible that this may be merely a manifestation of scurvy, the result of too much tinned food, and that such a condition may be an important factor in the low state of health so often noticed in residents of these colonies, quite apart from attacks of fever and other obvious tropical maladies.

It is therefore sufficiently clear that an efficient Government inspection of all preserved provisions is a *desideratum* of Imperial importance, which intimately concerns the development of many of our tropical possessions.

But it is not in the comparatively small item of preserved provisions alone that the public health is threatened by the impurity of food supplies. Milk, bread, and all foodstuffs in which adulteration is possible, are manipulated in shameless fashion.

Nor is the country producer any better than the town distributor, for it is notorious that the conditions under which milk is collected on farms, and cattle slaughtered in private abattoirs are often in the last degree revolting.

The whole business of the production and handling of food is, in fact, conducted without the least regard to either decency or cleanliness. To give a single example: Nothing is commoner, even in the best parts of the West end of London, than to see vegetables exposed for sale outside greengrocers' shops in such a position that they are accessible to any passing dog, and the baskets and their contents are actually often deeply stained with canine urine.

If this be a matter so common as to attract the notice of the casual passer by, it can hardly be supposed that the proprietors of these highly priced establishments can be ignorant of the disgusting consequences of the method they adopt to attract attention to their goods, and yet they continue to expose their customers to the certainty of having their food polluted in a most filthy manner rather than lose the chance of sale that would be involved in keeping their commodities properly protected.

That commercial rectitude and the caution of the buyer ever sufficed to protect the public against dirt and adulteration is more than doubtful, but whatever may have been the case in the "good old times," it is sufficiently obvious that stringent Government regulation of all branches of the food trade is an urgent necessity of the present day.

Another matter which calls loudly for Governmental interference is the abuse of advertisement.

It most emphatically is not a "pardonable exaggeration" to state a few teaspoonfuls of brown extractives, smelling suggestively like "secotine," represent the nutritive constituents of a cow crammed into the space of a cup, for though most buyers probably take the bare statement with some grains of salt, it may be taken as certain that they would not buy the stuff were they not persuaded that the contents of the tiny pot represent an amount of nourishment that could not possibly be concentrated to a reasonable bulk by any of the ordinary operations of domestic cookery, and as such is not the case, it is indisputable that the sellers obtain the purchase-money by false pretences, against which the public have as great a right to protection as they have against the wiles of the thimble rigger.

It must be remembered that it is especially the poor who put the most implicit trust in these lying advertisements and it is often pitiable to see hard-pressed parents and their other children pinched, to scrape together the extortionate price for some well-nigh valueless meat extract, which they fondly hope may rescue their sick child from the jaws of death: a half-crown for the amount of albumen contained in half of a penny egg!—not one whit more nutritious and far less appetising.

Not the least part of the evil is that the unfortunate victims of this system of fraudulent misrepresentation are so hypnotised by the emblazoned falsehoods that force themselves on their sight from every available wall and hoarding, that it is impossible to convince them of the uselessness of highly priced rubbish of the sort, and they will pinch themselves and defraud the butcher, baker and candlestick maker of their just dues, in order to obtain the coveted talisman, however strongly one may persuade them to the contrary.

It is as great a fraud to state that a teaspoonful of some or other concoction contains as much nourishment as a pound of beef-steak, as it is to substitute sand for sugar, and the public have as good a right to be protected against the one as the other fraud.

Were wilful misstatements of the sort dealt with as they should be by the public prosecutor, it is tolerably certain that in a very short time the trade in food specialities, which owe their popularity to nothing but advertisement and the gullibility of the public, would soon shrink to very modest dimensions, and it is hard to see why steps should not be taken to ensure so desirable an end.

AN ADDRESS

Delivered at the Opening of the Winter Session of the London School of Tropical Medicine, October, 1906.

By Colonel KENNETH MACLEOD, I.M.S., M.D., LL.D.
Honorary Physician to H.M. The King.

NEARLY three years ago, on December 7th, 1903, an address was delivered in this place by Sir Patrick Manson, whom I may without impropriety designate as the Brahma and Vishnu—the creator and sustainer—of the London School of Tropical Medicine. In that address Sir Patrick Manson described the origin, progress and prospects of the institution, and indicated its objects, achievements and requirements. The school, which was opened on October 3rd, 1899, had then completed the fourth year of its existence. An aggregate of 355 students had undergone instruction during thirteen sessions, and evidence was produced of good work accomplished in the hospital and school, and by many of its alumni who had utilised to advantage the lessons, theoretical and practical, which they had been taught.

During the three years which have elapsed since that address was delivered the school has continued to prosper. The aggregate of students who have attended during twenty-one sessions has increased to 617. Of this number 235 belonged to the Colonial Medical Service, for whose benefit and for the benefit of the colonies in which its members were destined to serve, the school was originally designed and organised, under the administration and personal initiative of that great Colonial Minister, the Right Honourable Joseph Chamberlain; 18 medical men employed by the Foreign Office, 29 officers of the Indian Medical Service, seven of the Royal Army Medical Corps, four

of the Royal Naval Medical Service, one of the Indian Civil Veterinary Department, and 33 medical officers serving under other governments passed through the School, making a total of 327, or 53 per cent. of the whole; 71 medical missionaries and 219 private students, or 290 non-officials (47 per cent.), availed themselves of the opportunities of studying tropical diseases afforded by the school. The large proportion of non-official students fully confirms the wisdom of the founders of the school in extending its benefits to all medical men, and I may add women (for the aggregate includes 40 ladies) interested in tropical diseases and mostly intending to practise in the Tropics.

The demand for admission into the school has been well maintained, and the number of entries for the present session has been, I learn, unprecedentedly large. A specially satisfactory feature in the statistics of attendance is that the number of students taking the full course of three months is on the increase. The status of the school has been strengthened by its affiliation with the University of London and the admission of tropical medicine as a sixth alternative subject for the M.D. of that University. The school course has also been recognised as entitling students to undergo examination for the Cambridge Diploma of Tropical Medicine and Hygiene. Thirty-two students of the school have succeeded in obtaining this diploma, and one student has gained the London M.D., taking tropical medicine as the optional subject. Special arrangements have been made for instruction with reference to the examination for the London Degree and Cambridge diploma. The rich experience of tropical and other diseases available in the Dreadnought Hospital has been placed at the disposal of medical graduates by the establishment of the London School of Clinical Medicine, and the services of eminent physicians and surgeons have been secured for imparting instruction in the institution.

Of the transformation which has taken place of a branch hospital into a well-equipped medical school, I have had opportunities of personal knowledge. Some twelve years ago I paid several visits to the Royal Victoria and Albert Docks' Branch of the Seamen's Hospital Society. About 20 patients were accommodated in the rooms of a small building. The patients whom I saw were seamen of many nationalities, who had been admitted from vessels trading with the Tropics, and suffered from diseases contracted in warm climates. The arrangements for their comfort and cure were excellent. The place was occasionally visited by medical men interested in tropical pathology; but no means of systematic instruction existed. There was a small room in which microscopic and bacteriological observations were made and demonstrations given of malarial and other parasites; but the work was necessarily limited to the clinical needs of the Hospital. Recently, under the guidance of Sir Patrick Manson, I visited this Institution—Hospital and School—as it now exists. The Hospital has been enlarged and can accommodate 50 patients. The new wards are spacious, clean and well ventilated, fitted with every appliance and supplied with every requisite for the treatment of the sick. The School building adjoining the Hospital, with its large and well-stocked laboratory, lecture room, museum, and library, is well adapted and provided for the instruction of 40 students; and, in addition to accommodation for the staff, provides quarters for 12 students, who are thus enabled to devote the whole of their time to their studies and practical work. The arrangements are well suited to their purpose and reflect credit on all concerned; but they are by no means complete, and the School must be looked upon as in a state of adolescence and immaturity. Effort and money are still necessary to enable it to accomplish all the good which its promoters and well-wishers desire.

It is satisfactory to know that the expenses connected with construction and organisation have, through the liberality of the Seamen's Hospital Society and the public, been fully defrayed. Conspicuous in the roll of benefactors is the name of the Honourable Bomanji Dinshaw Petit, of Bombay, who contributed 100,000 rupees to the School. Mr. Petit is evidently endowed with the liberal disposition of his family. His cousin, Sir Dinshaw Manakji Petit, Bart., among other benefactions, founded a veterinary hospital in Bombay, and contributed a large sum for a similar purpose when the Bengal Veterinary College, in whose creation I was deeply interested and concerned, was established in the year 1892. It is also gratifying to learn that the London School of Tropical Medicine is free of debt and able to pay its way; but in order thoroughly to fulfil its twofold object of education and research, the School needs further extension and development. The laboratory is not large enough for present requirements; additions are necessary for special purposes; with the exception of the Cragg's Scholarship no provision has been made for promoting and supporting research where it can most profitably be carried out, namely, in the Tropics; adequate remuneration is not given to lecturers and instructors, and the fees payable by students are high and capable of considerable reduction.

For these and other purposes more money is wanted. Sir Patrick Manson, in the address to which I have referred, estimated that £100,000 were required to place the School on a satisfactory and permanent basis. I understand that of this sum about £40,000 has been received. The remaining £60,000 would form an endowment which would expand the operations and enhance the usefulness of the School. Surely the wealthiest city and busiest port in the world may reasonably be expected, when the want is known, to contribute handsomely to the support of an institution whose work is designed to mitigate the loss of health and life, which interferes so greatly with the industry and commerce of our tropical colonies and dependencies, and causes such a waste of time, labour and money. The wealth of London and of England is largely drawn from the colonies and from the carrying trade connected with them; and any agency or institution which ministers to the promotion of health and prolongation of life, and thereby cheapens production, barter and transport, is deserving of encouragement and support. So that motives of benevolence and self interest combine to advocate the claims of the School to such liberal endowment, as to make it worthy of the city and country, and thoroughly competent to carry out those objects and operations whose aim is to benefit humanity and promote civilisation.

The necessity of special instruction in the diseases of tropical countries does not require argument or proof. As these countries have their peculiar flora and fauna, of which no general teaching of botany and zoology or special study of the plants and animals of temperate regions can supply a knowledge, so there are in the Tropics special manifestations and modifications of disease regarding which pathology and nosology, as taught in the medical schools of this country, afford very little information. The analogy is by no means a strained one, for the pathology of the present day is largely concerned with botany and zoology, and includes a study of vegetable and animal life. This fact has been widely recognised in the scheme of instruction arranged in this school. Through the liberality of the colonies the subjects of protozoology and helminthology have been added to the curriculum of study—a novel and important departure which merits commendation and imitation. The study of vegetable microbes is included in that of the diseases with which they are associated; but to complete the teaching of parasitology there is one subject which ought to be systematically developed, namely, pathological entomology. Insects, more especially blood-sucking insects, the mosquito and tsetse-fly for example, have been found to fulfil an important function in the conveyance of infective disease, and the harbouring and transmission of disease germs, and knowledge on this subject imperatively claims to be imparted and extended. Recent observations indicate that leprosy is spread by insect agency, and cholera, enteric fever, and plague are very probably similarly transmitted; but on these and other cognate points additional light is required. I trust, therefore, that a pathological entomologist will, in the early future, be added to the staff of the school.

The trend of modern investigation and thought has forced into the forefront the fascinating subject of comparative pathology, which has followed naturally but somewhat tardily on comparative anatomy and physiology. The researches of recent years, conspicuously as regards tropical diseases, have revealed a community of suffering and a reciprocity of infection and protection between man and the lower animal creation which have invested medical science with fresh interest and endowed it with larger power. In this connection it is pleasing to note that an agreement has been concluded between the London School of Tropical Medicine and the Royal Veterinary College, Camden Town, by which students of either institution may attend the other; and an interchange of demonstrations has been arranged. The inquiries and experiments which have made comparative pathology what it is, have been beneficial to both man and beast, and are capable of becoming more so—a point which is strangely overlooked by those who, from laudable but short-sighted motives, decry some of the methods by which our knowledge of influences, disabling and destructive, affecting animal life, is advanced. Physiologists and pathologists have been accused of callous selfishness and cruelty in subjecting the lower animals to experiment for the purpose of furthering medical science and improving medical art; but in investigating tropical diseases, men have, themselves, in numerous instances, incurred risks to health and life without hesitation. The true causation of yellow fever was discovered through the agency of volunteers who readily subjected themselves to dangerous hazards in disproving the old doctrine of infection by fomites, and proving the fact of communication by mosquitoes. In working out the problem of malaria, human experiment has also been largely resorted to, as in the two crucial tests which were applied by members of this School. In 1900, Drs. Sambon and Low braved the perils of the Roman Campagna during the fever season, and by protecting themselves from mosquito bites escaped the maladies which prostrated the unprotected inhabitants of that malarious tract; and in the same year Patrick Thurburn Manson and George Warren contracted ague in London by allowing themselves to be bitten by mosquitoes which had been fed in Rome on plasmodium-infected blood. Similar risks, fatal in some instances, have been run, in investigating Malta fever, cholera and plague, and among recent medical martyrs the names of Lazear, Myers, Dutton and Tulloch, deserve special and regretful record. The study of comparative pathology is peculiarly needful in the Tropics where, under a different environment, life, and conspicuously parasitic life, is more exuberant than in temperate regions, and the struggle between the higher and the lower life, between the things and forces that make for development and construction, and those that make for decadence and destruction, is more keen and stringent.

The facts and laws of comparative pathology lead up to the higher reaches of transcendental biology and furnish new illustrations of the law of survival of the fittest, which the genius of Darwin formularised, and his industry so amply exemplified and established. It is important to note, however, that in this struggle the issue depends on circumstances and conditions, and is fortunately subject to the dominance of mind. The survival is not necessarily of the higher organism. In a state of uncontrolled nature the parasite is apt to obtain the mastery, the lower life to flourish at the expense of the higher; and this is specially true of the Tropics, with their luxuriant vegetation and teeming animal life. There the lower life is rampant, and the higher heavily handicapped in the contest. But when the earth is, according to the divine command, subdued for the use of man, when the primeval forest is cleared, the swamp drained, the desert irrigated, when crops serviceable to man are cultivated, and native races trained to agriculture and commerce, educated and civilised; when ignorance, poverty and filth are diminished or abolished, the parasite is at a disadvantage, physique and health are improved and life is prolonged.

The salutary effect of drainage, cultivation and cleansing, is well illustrated by the banishment of malarial disease from England. Epidemics of dysentery, which used to rage from time to time, are no longer heard of; typhus and relapsing fevers are seldom met with; plague and leprosy have receded eastward, and cholera has latterly been held at bay. In India there has also been a marked improvement in public health in consequence of undertakings such as railways, canals, waterworks and drains, which were appreciatively referred to by the Right Hon. John Morley, in his recent speech in the House of Commons.

I could, did time permit, cite numerous instances of the abatement of the incidence and mortality of fevers and fluxes in Indian towns by means of sanitary reforms, particularly vaccination, the supply of pure water and improved drainage and conservancy. I see no reason why health should be worse and life shorter in tropical than in temperate latitudes, when the conditions which affect vitality and longevity are properly understood and made the subject of proper control. In a word, what is required in the Tropics for healthy existence is reclamation—economic and sanitary—and these should go hand in hand. To this end the efforts of the whole community, not of medical men and sanitarians only, but of every member of the population, are required, and sanitary education should be made universal and compulsory. As a step in this direction, I am glad to learn that Sir Patrick Manson is preparing a catechism of tropical hygiene which he proposes to place in the hands of persons proceeding to the Tropics, and make the subject of examination as a condition of service.

The marvellous progress which has taken place during the last quarter of a century in our knowledge of the nature and causation of disease, to which the study of tropical diseases has so materially contributed, has radically revolutionised our notions regarding pathological processes. We have been compelled to widen our view and to devote more attention to the environment. Important as is the study of the host and his environment, hardly less important is that of the parasite and its environment. It is essential now that the life history of both should be worked out, and the conditions affecting both beneficially or prejudicially. Disease is no longer looked upon as a malignant entity, but as a mode of salutary resistance to noxæ; and such processes as fever and inflammation are found to be protective and curative in their purpose and effects rather than of themselves deleterious. This view proclaims the supreme importance of the study of the noxæ, as well as of the disturbances of health and function to which they give rise. The matter assumes an intenser interest when we consider that there exist in the animal body, materials whose office it is to destroy the noxæ—to kill the microbe and antagonise the poison elaborated by it. The existence of these materials and of their power, constitutes a startling instance of that adapted prevision commonly called design, which pervades nature, and whose most subtle and conspicuous manifestation is in the working of the human brain. To develop and strengthen these resistive and curative elements in the animal organisation, is one of the chief, if not the chief, object of medical science; and—greatest marvel of all—we are learning to use pathogenetic micro-organisms for this purpose, just as in the septic tank system we are employing saprophytic microbes to hasten the return of matter which has ministered to organic life, to inorganic forms, and thus to accelerate the process of decomposition, the intermediate products of which are so apt to be dangerous to health. The preparation of protective and curative vaccines and sera is engaging the attention of our most able and advanced pathologists. Even cancer, which seems to belong to the category of the infective granulomata, is being diligently experimented on from this point of view, with results which offer some promise of eventual success. The principle which underlies the great discovery of Jenner, is, after the lapse of over a century, obtaining new and remarkable applications; the familiar formulæ, *vis conservatrix naturæ* and *vis medicatrix naturæ*, are undergoing incarnation, and the intuitions of our forefathers are being converted into material facts.

In offering these observations I have, I fear, been wandering among the hazy heights of generalities; but on an occasion such as the present it seems fitting to survey the field of work as a whole—its extent, condition and capabilities—rather than examine minutely the tilth of some particular portion of it. Generalisation is a delightful exercise, and speculation, or, as Tyndall phrased it, the scientific use of the imagination, is capable, when rightly and cautiously employed, of guiding and aiding enquiry. If we can find "tongues in trees, books in the running brooks, and sermons in stones," we may reasonably expect to discover philosophy in epiphytes, wisdom in worms, and, I may add, "good in everything." But the process of generalisation is prone to become, when misused, both misleading and unproductive and is apt to be beguiling. It is so much easier to think out than to work out a problem. No better illustration of this has ever been furnished than in that land of ideals and shams—India. The genius of James Lumsdaine Bryden, in the early sixties, sought to extract pathology and etiology from arithmetical units and aggregates of units; and strange doctrines concerning pandemic waves, aerial conduction and convection, and forces cosmic, telluric and climatic, became rampant. It is fair, however, to Bryden's memory, to state that his chief achievement, the discovery of the great prevalence of enteric fever in the European Army of India, was based on an intelligent study and interpretation of cases and *post-mortem* examinations, recorded by medical officers. The *reductio ad absurdum* of Bryden's visionary views was accomplished by James Macnab Cunningham, who, with a logical Scotch mind, showed unwittingly how they led to scepticism and nihilism. But, ever since the arrival of the English in India, there have been men who investigated the diseases of the country by clinical methods. The names of Johnson, Twining, Annesley, Webb, Martin, Goodeve, Morehead, Chevers, Carter, Moore and Fayrer, merit remembrance. Their work possesses great value, but it was too exclusively devoted to the subject of disease and the environment was neglected. A new era of systematic, practical observation, was opened by the deputation of Timothy Lewis and David Douglas Cunningham, in the year 1870, to investigate cholera by the methods which they had learned in the Army Medical School, Netley, which was an early pioneer in the special study of tropical diseases, and in which, from first to last, clinical and practical systems of study were followed. It is education of this sort that has fitted men like Bruce, Ronald Ross, Leslie, Roberts, Leishman, and Donovan, to accomplish work which has revolutionised tropical medicine, and, under the stimulating influence of Professor (now Sir) Almroth Wright's instruction, numerous observers, among whom I may specify the names of Lamb, Rogers, Liston, Douglas,

Bannerman, Buchanan, Christophers, James, and Greig, are now engaged in fruitful researches in India. Lewis and Cunningham did excellent work in many directions; but the methods which have been instrumental in adding so materially to our knowledge, particularly staining, pure cultivation and animal experimentation, did not come into full use in their time. The Government of India has now responded to the demands of modern medical science, and has resolved to establish laboratories for clinical aid and pathological research throughout India. Many of these are already in existence and active operation. The Pasteur Institute, at Kasauli, has been converted into a central research laboratory, under the direction of Lieut.-Colonel Semple, another disciple of Wright's; the King Institute at Guindy, in Madras, under Lieut. Christophers, is fully fitted for vaccine bacteriological and pathological investigations; the plague research laboratory in Bombay, organised by Haffkine, and Hankin's laboratory at Agra, are available for all kinds of inquiries, and Lingard's laboratory at Muktesar is devoted to similar studies in veterinary pathology. Other institutions of the same kind are being established, and in time every large hospital in India will no doubt have its laboratory.

To those who are about to commence their studies in this school I offer hearty congratulations on the excellent opportunities they possess for fitting themselves for the responsible duties of their future career. My own experience enables me to bear thankful testimony to the priceless benefit which I derived during my twenty-six years' service in India, from the vivid pictures of tropical disease which Maclean presented to us at Netley, and the sound lessons conveyed to us in the lecture-room, wards and laboratory, regarding their prevention and treatment. Since the year 1865 our knowledge of tropical diseases and of the means by which they are most profitably investigated has undergone a startling advance. I realised this acutely when, in 1897, I was appointed to occupy the Chair of Military and Clinical Medicine, which Maclean had so ably filled; and so rapid did this advance continue to be that, during my eight years' tenure of that office, I found it necessary from term to term materially to alter my lectures—to modify, to cancel, and to add. You are fortunate in being inheritors of the great accession to our knowledge of tropical pathology and hygiene which recent years have brought. There is hardly a subject which has not undergone illumination. Malaria, cholera, plague, leprosy, yellow fever, Malta fever, filariasis, ankylostomiasis, trypanosomiasis, kala-azar,—to catalogue some brilliant examples—have been investigated with diligence and success. Their special causes have been demonstrated, and important indications for their prevention and treatment supplied. But great as have been the triumphs much work still remains to be done on these and other subjects. The more we know the more we want to know. As the circle of knowledge widens the horizon of ignorance also seems to extend. The etiology of dysentery is still very obscure, and the relation of its different forms to hepatic abscess; we are still in ignorance regarding the causation of beri-beri, sprue, dengue, epidemic dropsy, infantile biliary cirrhosis, and many of the infective granulomata; and the strange terms, ponos, goundou and ainhum, require pathogenic explanation. Why is the native of India relatively immune to the infection of enteric fever? Why do dysentery and beri-beri break out in the lunatic asylums of temperate regions, while the general population remains exempt? What is the relation between hill diarrhœa and sprue, whose symptoms are almost identical; and between kala-azar and Delhi boil, which appear to be caused by the same micro-organism? Why is the embryo of filaria nocturna absent from the blood in elephantiasis, which appears in the great majority of cases to be caused by filarial infection? These are a few examples of problems which still await solution. This school has already sent forth many earnest and successful workers, among whom Low, Daniels, Castellani, Bentley, Wise, Balfour and Philip Ross, deserve special notice; and the inspiration and training which you will imbibe and undergo here will stimulate and qualify you to follow their footsteps. The assimilation of knowledge is very precious, but the acquisition of aptitude for increasing knowledge is much more so. But, while discovery and invention are objects of high and laudable ambition, few are gifted with the power of productive original research, and it is very remarkable how meagre are the really permanent contributions to science of even the most gifted. Still it is open to every one to aid in some manner and measure, however humble, in the building of the temple of medicine. Permit me finally to remind you that the main purpose of your lives, as practitioners of the art of medicine, as it is the prime motive and glory of your profession, is to promote the welfare of man, to prevent and cure disease, to relieve suffering and prolong life. In striving to accomplish these ends you will earn gratification and gratitude, even if you fail to gain fame or fortune.

A vote of thanks to Colonel Kenneth McLeod was proposed by Mr. Edmund Owen, F.R.C.S., and seconded by Sir Frederick Young, K.C.M.G.

Sir George Denton and Fleet Surgeon P. W. Bassett Smith, R.N., also spoke.

A large number of people were present, including Professor Blanchard and Dr. P. Joly, from Paris.

The Annual Dinner.

The London School of Tropical Medicine and the London School of Clinical Medicine held their annual dinner at the Hotel Cecil on October 8th, 1906. Sir Wm. Hood Treacher, K.C.M.G., occupied the chair.

Amongst those present were:—Prof. Blanchard, Paris; Inspector General H. M. Ellis, K.H.P., Medical Director General of the Navy; Surgeon General A. M. Branfoot, C.I.E., President of the Medical Board of the India Office; Col. Kenneth McLeod, I.M.S.; Sir William Bennett, K.C.V.O.; Sir Patrick Manson, K.C.M.G.; Sir Dyce Duckworth; Sir John McFadyean; Sir Francis Lovell, C.M.G., Dean, London School of Tropical Medicine; Commander G. Hodgkinson, R.N.; Fleet Surgeon P. W. Bassett-Smith, R.N.; Percival A. Nairne, Esq., Chairman of the Committee of Management, S.H.S.; H. J. Read, Esq., Colonial Office; J. H. Batty, Esq.; A. E. Aspinall, Esq.; E. R. Davson, Esq.; Prof. W. J. Simpson, Prof. R. T. Hewlett, Dr. F. H. Anderson, Dr. Oswald Baker, Dr. Robert Boxall, Dr. H. Burrows, Dr. C. C. Choyce, Dr. C. W. Daniels, Dr. J. Mackenzie Davidson, Dr. Andrew Duncan, Dr. W. Fox, Dr. J.

Galloway, Dr. Russell Howard, Dr. P. Joly (Ministry of Marine, Paris), Dr. A. Ernest Jones, Dr. T. D. Lister, Dr. G. C. Low, Dr. Stephen Mayou, Dr. Guthrie Rankin, Dr. L. W. Sambon, Dr. G. E. Waugh, Dr. Russell Wells, Mr. Malcolm Morris, Mr. James Cantlie, Mr. L. V. Cargill, Mr. K. W. Goadby, Mr. A. Lawrence, Mr. L. H. McGavin, Mr. P. Michelli (Secretary).

The following telegram was read from the Duke of Marlborough, who was to have taken the chair: "Much regret unable to preside at this evening's dinner. Trust that both branches of school may receive that public support and recognition which their untiring efforts and skill so richly deserve."

The toast of "The King" having been honoured,

The Chairman proposed the toast of "The London Schools of Tropical and Clinical Medicine." He said that during his service in the Eastern Tropics, extending over some thirty-three years, he had come across a number of doctors who had had the advantage of passing through the school, and he had always found them to be keen officials, devoted to their important work, kindly, hospitable and charitable. For a considerable time he had taken a keen interest in the London School, which owed its origin, in the year 1899, to that great Colonial Minister and Imperial statesman, Joseph Chamberlain, whose restoration to health and return to active political life men of all parties anxiously desired. He had done his best to support and encourage in every way the foundation of an institute for medical research in the Malay States, the idea of which emanated from the fertile brain of that distinguished Colonial administrator, Sir F. Swettenham. The London Tropical School had now a hospital with 50 beds, and there was accommodation in the laboratory for 40 students. Nearly all of these places were occupied, and it was evident that further accommodation would be necessary in the future. Altogether 617 students had passed through the school. The Tropical School, although its financial position was sound, he would remind them that it was essential that a capital sum should be obtained to form an endowment by which the teachers in the school be adequately paid and full facilities afforded for research.

The London School of Clinical Medicine, which was a new organisation, had been established for the purpose of supplying the increasing demand for post-graduate teaching in London. It was the aim of the Clinical School, with the aid of the Committee of the Seamen's Hospital Society, to provide in London such teaching as might compare with that of any other centre of education.

Sir Patrick Manson, in replying to the toast, said that not many years ago some wise men shook their heads over the London School of Tropical Medicine, and a great many unwise men spoke with contempt of it. The result, however, had certainly not justified the prognostication. At present the school was recognised by the University of London and by the Colleges of Physicians and of Surgeons as a *bonâ fide* and valuable teaching institution. Through their school important contributions had been made to the advance of medical science, all having more or less a bearing on human pathology and human disease.

Drs. Castellani, Leiper and Wenyon, had each contributed during the past year important original observations, and many other old students of the school had added to our knowledge of tropical disease. Lack of funds prevented the school undertaking all that was desired and desirable in the elaboration of discoveries and observations; laboratories, and specially qualified men to work in them were imperative; and the equipment could not be considered complete until an entomologist was added to its strength.

Sir Dyce Duckworth responded to the toast of the London School of Clinical Medicine. He stated that this important post-graduate school was founded by the energy and enterprise of the Committee of the Seamen's Hospital, who had already laid the country under a deep debt of gratitude for the School of Tropical Medicine. It is to be hoped that the London School of Clinical Medicine will have a great future, and that everything the medical staff and teachers could do to develop the School would be carried out in a whole-hearted manner.

Professor W. J. Simpson proposed the toast of the orator of the day, "Colonel Kenneth Macleod." He stated that neither in India nor at Netley would Colonel Macleod's work be forgotten. He had retired after an honourable and distinguished career, and amongst the great men who had illuminated the Indian Medical Service, or who had filled the chair of Military Medicine at Netley, Colonel Macleod's name would occupy a foremost place.

Colonel Kenneth Macleod, in reply, said that the London School of Tropical Medicine was a great school, one that the country might be proud of, and the people throughout the Empire ought to be thankful for the beneficent work it had done and is doing.

Sir William Bennett proposed the toast of the "Visitors," and accorded a special welcome to Professor Blanchard, who at all times had shown so kindly a disposition towards the Tropical School.

Professor Blanchard (Paris), in reply, stated that the London School of Tropical Medicine had stimulated the teaching and investigation of tropical diseases in the British Empire, and set an example which was being followed by all civilised countries. In a brilliant speech Professor Blanchard congratulated the British Schools of Tropical Medicine upon their work.

Inspector-General Ellis, Director-General of the Medical Department of the Royal Navy, said that they were well aware of the enormous benefits they had received from the teaching of the Schools of Tropical Medicine in London and Liverpool.

Surgeon-General Branfoot, C.I.E., on behalf of the Indian Medical Service, said he was glad to see that officers of the Indian Service availed themselves whenever possible of the teaching of these great schools.

Mr. P. A. Nairne, Chairman of the Seamen's Hospital Society, proposed the toast of "The Chairman." Sir Wm. Treacher Hood was one of many Englishmen who had guided the destinies of the British Colonies to success, and amongst the great governors of our colonies the Chairman took a high place.

The Chairman, in acknowledging the toast, paid a well-deserved tribute to Mr. P. Michelli, the Secretary of the Seamen's Hospital.

List of Students at London School of Tropical Medicine, October 8th, 1906:—

Indian Medical Service.—Major R. H. Castor, M.R.C.S., L.R.C.P.; Major S. A. Harriss, M.B., C.M. (Edin.), M.R.C.S., L.R.C.P., D.P.H.(Camb.); Major J. B. Smith, M.B., B.A., M.Ch.(R.U.I.)

Colonial Service.—E. W. Graham, M.B., C.M. (Glasgow); H. W. Gush, M.B., Ch.B.(Edin.); F. I. M. Jupe, L.S.A.; H. McG. Newport, L.R.C.P. & S.; W. B. Orme, M.R.C.S., L.R.C.P.; P. H. Pereira, M.B.(Madras), 1905, M.R.C.S., L.R.C.P.; A. B. S. Powell, L.R.C.P. & S.(Edin.); C. C. Robinson, M.B. (Lond.), M.R.C.S., L.R.C.P.; R. F. Williams, M.B. (Camb.); W. J. Von Winckler, M.R.C.P., L.R.C.P., L.S.A. (Member Inner Temple, London).

United States Army.—Capt. J. M. Phalen, U.S. Army, M.D.(Univ. of Illinois).

Missionaries. — W. Cammack, M.D.(N.W.Univ., Chicago), and Mrs. W. Cammack, M.A., M.D.(State Univ., Iowa), American Board of Missions; C. F. Fothergill, M.R.C.S., L.R.C.P., M.B., B.C.(Camb.), B.A.(Camb.), Church Missionary Society; Hannes Heikinheimo, L.M., Helsingfors, Finland, Missionary; R. Howard, M.B., B.Ch.(Oxon)., M.A., University Mission; G. F. Stooke, L.R.C.P. & S.(Edin.), L.F.P.S. (Glasgow), Church of Scotland Mission.

Private.—Otto Bluhme, M.D. (Havana); E. P. Caropoulos, M.D. (Athens); Miss B. Cunningham, M.B., Ch.B.(Edin.), L.M.(Dublin); A. MacDonald Dick, M.B., Ch.B.(Edin.); P. R. Egan, M.D. (Columbia, New York); T. Giordani, M.D. (Rome); J. G. F. Hosken, M.R.C.S., L.R.C.P.; Miss Mary Kidd, M.B. (Lond.); J. A. Knebel, M.D. (Utrecht and Amsterdam); E. J. Maxwell, B.A.(Camb.), M.B., B.C. (Camb.), M.R.C.S., L.R.C.P.; Miguel Paz, M.D. (Guatemala); H. B. G. Newham, M.R.C.S., L.R.C.P., D.P.H.(Camb.); A. H. Reid, M.B., C.M.(Edin.); P. M. Rennie, M.B., Ch.B.(Edin.); F. O. Stoehr, M.B. (Oxon); F. M. Suckling, M.B., Ch.M.(Sydney); K. Raman Tampi, B.A. (Madras), M.B., Ch.B.(Edin.); W. A. Trumper, M.R.C.S., L.R.C.P.; J. C. Venniker, M.D.(Durham), F.R.C.S.E., M.B., B.S., D.P.H. (Durham), M.R.C.S., L.R.C.P.; W. W. Woolliscroft, M.R.C.S., L.R.C.P.

Indian Medical Service 3, *Colonial Service* 10, *United States Army* 1, *Missionaries* 6, *Private Students* 20; *Total* 40.

Obituary.

COLONEL ALEXANDER CROMBIE, M.D., C.B.

It is with the deepest sorrow and regret we announce the death of Colonel Crombie, C.B., late of the Indian Medical Service, and a member of the Advisory Committee of the Journal of Tropical Medicine. Although the obscure illness from which he suffered, and which confined him to bed for nearly two years, prepared his many friends for the end, yet his death came suddenly and unexpectedly, at a time when he was being taken abroad for the winter. He died at an hotel in Dover, on his way to the Continent. By Colonel Alexander Crombie's death, the profession loses one of its brightest ornaments. A clinician of the first order, he brought to bear on his work not only a keen intellect, ripened by a vast experience, but also an attractive personality, full of sympathy, generosity and kindness, which inspired confidence in those who consulted him, and endeared him to all his friends. Born in Fife some sixty-one years ago, of a good family, his childhood was spent in the country, where the fields and hills and heather implanted a passion for poetry and flowers, which continued throughout his life, and made him a charming companion to his most intimate friends. After a distinguished career at Edinburgh University, he graduated with honours in 1867, and settled in practice near Berwick-on-Tweed. Later, however, he gave up practice and entered the Indian Medical Service, in which he soon distinguished himself, and was rewarded by being appointed successively to some of its more important civil-surgeoncies, such as those of Rangoon and Dacca. On his transference to Calcutta he became Surgeon-Superintendent of the European General Hospital, a position which not only placed him at the head of the most important hospital in Calcutta, but also brought with it a large consulting practice. He retained this position until he retired in 1898, and was appointed a member of the Medical Board at the India Office. It was in his capacity as a member of this Board that he was deputed to the Army Board to medically examine officers starting for and returning from the South African War, and it was for this service, which entailed an enormous amount of work, together with the good service he had done in India, that he was decorated with the Order of the Companion of the Bath. Gradually he was acquiring a large consulting practice in London in tropical diseases, and there is no doubt that if he had not been attacked by this untimely illness, the pain and suffering of which he endured with so much patience and fortitude, his special knowledge of tropical diseases would have given him one of the largest consulting practices in London. Colonel Crombie was lecturer on tropical diseases in the Middlesex Hospital, and also at the London School of Tropical Medicine. He was an excellent lecturer, and the loss which these schools have sustained is very great. His contributions to medical literature are particularly valuable, coming as they do from a keen and experienced observer. Among these may be mentioned his observations on the normal temperature of Europeans and natives in India, in which he showed that natives of India had a higher temperature than Europeans, and Europeans in India a higher temperature than Europeans in temperate climates. His paper on the unclassified fevers of the Tropics is also a memorable one, in that it foreshadowed much that has been since verified by microscopical research and discovery. Colonel Crombie leaves a widow, a son and two daughters to mourn his loss. Our deepest sympathy is with them in their sad bereavement.

Notices to Correspondents.

1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the Journal of Tropical Medicine should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

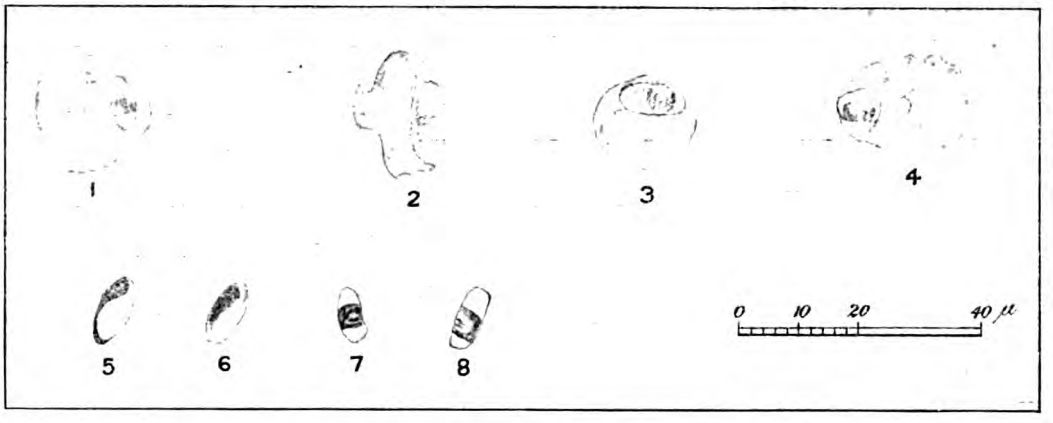
Original Communications.

NOTE ON A LEUCOCYTOZOON FOUND IN *MUS RATTUS* IN THE PUNJAUB.

By Colonel J. R. Adie, I.M.S.
Ferozepore, India.

Note.—By Major Ross, C.B., F.R.S., Professor of Tropical Medicine, University of Liverpool.

This report was handed to me by Colonel Adie, I.M.S., last July, for publication in the forthcoming number of the Thompson Yates and Johnston Laboratories' Reports. Owing, however, to the delay in this publication, I have not been able to give effect to Colonel Adie's wishes. I have now requested the Editor of the Journal of Tropical Medicine to publish the paper in view of the interesting article by Dr. Cleland in that journal for October 1st.



1, 2, 3, 4, show the parasite in the leucocyte. 5, 6, 7, 8, represent parasites with well-stained nuclei, showing the peculiar arrangement of the chromatin.

Last January, while engaged in examining the peripheral blood of a series of ordinary house rats (*Mus rattus*) in Ferozepore (Punjaub), I came upon a film which showed something unusual—a parasite in a leucocyte.

I have not yet had an opportunity of studying this parasite in the fresh state, and the description which follows is derived from specimens met with in many films from more than one rat, the films being stained by the long Romanowsky method.

The appearance of an affected leucocyte is striking, and an observer cannot fail to have his attention drawn to it, even with a ⅔ obj. and No. 4 E.P. In fact, by this combination, one can most easily recognise a specimen in the film.

The parasite is not, so far, found in all varieties of leucocytes, but only in those which might be classified, according to definition of terms, as transitionals and mononuclears.

Its shape is uniformly oval, and the nucleus well-defined. It appears to have a well-marked and well-stained cell wall. The protoplasm is either uncoloured, or sometimes shows a faint pink staining, especially towards the periphery. Not infrequently, faintly stained red dots, six to twelve in number, are seen in the neighbourhood of the nucleus, and, occasionally also at one end of the oval. In one specimen the entire protoplasm showed faint stippling.

The nucleus is peculiar. The shape is most often quadrilateral, with rounded angles. It occupies the whole, or nearly the whole, width of the cell, is situated rather nearer one end, and what is very striking, generally shows transverse striation. These striæ are not always parallel, but may appear as curious patterns. The above seems to be the appearance as seen on the flat. At other times, the nucleus is oval, or crescent-shaped, or obliquely pear-shaped; and this seems to be the side view.

The outline of the organism can be clearly made out, even when the nucleus of the leucocyte is quadrilateral, or annular, or approaching the polynuclear shape.

The length of this leucocytozoon is from 9·8 to 13 microns, and breadth from 5·2 to 6·5. The average dimensions are 11·7 by 5·6 microns. The nucleus, when quadrilateral, is about 5 or 6 microns square.

No pigment has been seen either in the parasite, or in the affected leucocyte. Only one free specimen has been met with.

In a series of thirty-nine rats examined, the leucocytozoon was met with in eight, or 20 per cent.; and in the same series, trypanosomes were found in sixteen, or 41 per cent. The leucocytozoon was found only in cases where trypanosomes were also found. In other words, half the rats harbouring trypanosomes were found to be harbouring the leucocytozoon. Roughly speaking, the numbers of the two parasites corresponded, that is, when trypanosomes were numerous, leucocytozoa were numerous; but in three cases, trypanosomes were very numerous and no leucocytozoa were found.

Through the kindness of Captain Liston, I.M.S, of Bombay, I have seen some of his preparations of spleen smears of rats, taken in the Punjaub when he was investigating plague. He also noticed this leucocytozoon. In his stained smears the parasites look

oval, and the nucleus oval too. But I could not make out any particular nuclear structure. Nor is one able to say if the leucocytozoon has any relation to trypanosomes, as the latter are not common in rat spleen smears. The different appearance of the nucleus in Captain Liston's and my specimens may be accounted for by the manner of spreading; his being a spleen smear, and mine a blood film.

It has been noted that the parasite inhabits a particular kind of leucocyte—a large cell, whose nucleus is never seen round, and never multiple, with connecting strands. It is an oval, or an indented oval, or a ring, or it has an irregular shape. The protoplasm is hyaline. It is not easy to make a count of these films, as the greatly-varying shapes of nuclei make it difficult to classify the cells as polynuclear, or transitional, or mononuclear. There is also the difficulty of intermediate forms. It seems the rat, normally, has a greater number of transitionals and mononuclears, proportionally, than man; so that it becomes necessary to separate the transitionals in making counts.

The following table shows counts in rats' blood (*a*) without any parasites, (*b*) with many trypanosomes, and (*c*) with many trypanosomes and many leucocytozoa.

	a No parasites	*b* Trypanosomes only	*c* Trypanosomes and Leucocytozoa
Polynuclears ..	22·3	25·6	25·
Transitionals ..	17·	17·6	15·7
Mononuclears ..	14·5	21·6	7·7
Lymphocytes ..	44·4	32·6	51·
Eosinophiles ..	1·6	2·3	·6
Basophiles ..	·2	·3	·0

Bentley and James [1] have found a leucocytozoon in the dog in India. James states that it almost invariably invades the polynuclears. Some of his figures are of leucocytes, whose nuclei seem to point to the transitional type, but the protoplasm is depicted as granular. James's *Leucocytozoon bentleyi* is 10½ by 5¼ microns. Its shape is not quite the same as this rat's parasite; it may be associated with filaria and piroplasma.

Christophers [2] describes a somewhat similar parasite, *Hæmogregarina gerbilli*, in the Indian field rat. It is partly curved on itself, and enlarges the *red blood corpuscle* from 5½ to 6½ microns to 10 by 7 microns.

Balfour [3] describes a hæmogregarine in the desert rat, Jerboa. It may be free, or in the remains of a red cell—size 5·6 to 7 by 1·4 to 2·8 microns. The free form is 3 red-cell-diameters long, and 2·8 microns wide. He states incidentally, "I have recently discovered what seems to be the same parasite in the mononuclears of the Norway rat (*Mus decumanus*) in Khartoum. It is probable it exists as a leucocytozoon in the rodents." From the figure of this latter, the parasite is seen to have a close resemblance to the Punjaub specimen, and to inhabit a leucocyte which may be counted transitional or mononuclear.

Patton [4] has recently described a leucocytozoon in the mononuclears of the palm squirrel, both in the cells and free. He notes the large number of mononuclears in a film, but does not speak of transitionals. His leucocytozoon also shows a curled tail. Free forms are common, 13 to 14 microns by 3 to 4 microns. Intracellular forms measure 10 by 5 microns. Many leucocytes have two parasites. It would appear that trypanosomes are common in this specimen of squirrel, but no particular mention is made of any relationship.

If this parasite has been hitherto undescribed, I propose the name, *Leucocytozoon ratti*.

REFERENCES.

[1] JAMES. *Scientific Memoirs*, Government of India, No. 14.

[2] CHRISTOPHERS. *Scientific Memoirs*, Government of India, No. 18.

[3] BALFOUR. "Hæmogregarine in Desert Rat," JOURNAL OF TROPICAL MEDICINE. August 15th, 1905.

[4] PATTON. *Scientific Memoirs*, Government of India, No. 21.

OCCURRENCE AND HABITS OF SOME SPECIES OF HUMAN BITING FLIES BELONGING TO THE FAMILIES *TABANIDÆ* AND *MUSCIDÆ* (*GLOSSINA*), FROM THE WEST COAST OF AFRICA.

By G. C. DUDGEON, F.E.S.

(*Superintendent of Agriculture for British West African Colonies and Protectorates.*)

HAVING had the exceptional opportunity of visiting all the British West African Colonies and Protectorates during the present year, I think it probable that a few notes I made in connection with the habits of some of the biting flies found there, which attack human beings, may be of interest.

I shall make no reference to the *Culicidæ* (Mosquitos) or *Simulidæ*, but confine my remarks to the *Tabanidæ* (Horse flies) of the genera *Tabanus*, *Chrysops* and *Hæmatopota*, and to *Glossina* of the family *Muscidæ*.

The effects of the bites of these flies upon human beings are very different in severity, which point, I think calls for further investigation. It is recognised that among the *Glossina* the species *palpalis* conveys the *Trypanosoma* causing sleeping sickness, and that various other *Glossina* species in a like manner carry the parasite of the "fly disease" among cattle. In addition to this Mr. Austen now admits that there is evidence of species of *Tabanus* transmitting a disease among dromedaries in Algeria, which is also caused by a *Trypanosoma*.

I did not find that the natives in any part paid particular attention to the attacks of "tsetse" fly (*Glossina*), but in places a species of *Chrysops* was not so lightly regarded. Of this genus the one which is held in the greatest dread is a bright reddish coloured species, which had been placed, until the present, under the name of *C. dimidiatus* in the British Museum, but as my specimens included the true *C. dimidiatus* (v. d. Wulp), this red one has now to be called by a new name. As far as I was able to make

FIG. 1.

FIG. 2.

FIG 3.

FIG. 4.

FIG. 6.

FIG. 7.

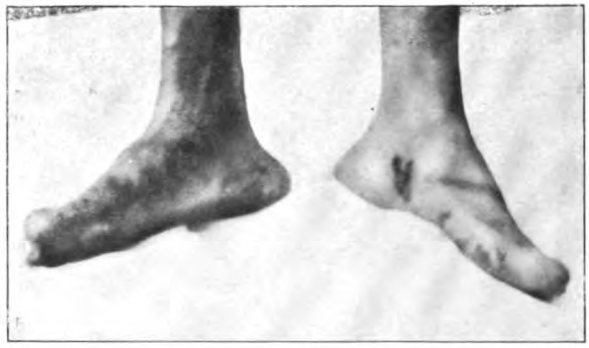


FIG. 8.

FIG. 9

FIG. 10.

FIG. 11.

FIG. 12.

FIG. 5.

To illustrate paper by F. CREIGHTON WELLMAN, M.D., "Notes on Some of the More Obvious Disease Conditions seen on the line of the projected Lobitokatanga Railway."

out this *Chrysops* n. sp. is known to the natives of the Calabar district under the name of "O-owe," but I did not ascertain the native name in the Warri province. Both *C. dimidiatus* and this new species were found commonly at Ologbo near Benin City. The latter species was first brought to my notice by Mr. Munro, Ex.-Engineer to S. Nigeria, when we were encamped at the last-mentioned place. The effects from a bite of *C. dimidiatus* were similar to a honey-bee's sting, causing a good deal of pain and inflammation, but from that of the red *Chrysops* even more severe with dropsical-like swelling of the limb and high temperature. My carriers appeared very much afraid of this insect and hastily dropped their loads when one came near in order to arm themselves with branches to ward off its attack; this they never troubled to do for other biting flies. Both species mentioned are somewhat similar to *Syrphidæ* (Hover flies) in appearance and, as they also hover round the person they intend to attack, their flight is not unlike that of these flies. The following are the localities where I met with them.

Chrysops dimidiatus (v. d. Wulp) Ologbo, Benin City (S. Nigeria).

Chrysops n. sp. Ologbo, Benin City, Sapele (Warri province); Odut, Uwet (Old Calabar province).

Hæmatopotas of two or three species occur commonly in the shaded paths throughout the West African Colonies, the most frequently met with being a dull black insect with mottled wings (my specimens of this have apparently become destroyed in transit). When travelling in a hammock this insect is often seen crawling slowly about the undersurface of the sun-protecting roof. The only example of the genus which I have preserved is one which was caught after having bitten a passenger upon a lower Niger steamer. Miss Ricardo has marked this "n. sp. near *Hæmatopota strigipennis*, Karsch." The bite does not appear to be serious in consequences.

Tabanus is a genus which is represented by a large number of well-marked species on the river Niger and tributaries as well as the other rivers along the coast. The approach of a *Tabanus* is made known by its loud buzzing, but the attack is not usually made by the insect at the point upon which it at first settles. In one case I witnessed *Tabanus testaceiventris* Macq. alight upon the back of a native at the wheel of a steam launch in which I was travelling, and, although it crawled over the man's bare flesh for some time, it did not attempt to bite until it had reached the outside of a vest which he wore, when it tried to drive its proboscis through the material in order to do so. The bites of all the species I met with, and which I had personal experience of, resulted in a painful swelling, which generally subsided in a few hours. The species which gave most trouble upon the creeks of S. Nigeria were *T. gabonensis*, *T. thoracinus* and *T. nigrohirtus*, while in N. Nigeria *T. tæniola*, *T. fasciatus* and *T. testaceiventris* were most conspicuous. *T. biguttatus*, of which the male is differently marked to the female, I found upon three or four occasions in a verandah in Lokoja, but it never seemed inclined to bite, only crawling slowly about flowers or verandah posts. On two occasions I took specimens of *T. obscurissimus*, upon the ground, having lost both wings. I can offer no explanation for this, although the coincidence seems rather remarkable. Some of the species of the genus are brightly coloured and the eyes of many in life are brilliant coppery green or blue. Below I give a list of the species obtained with notes concerning the colours of the eyes of some. I am much indebted to Mr. Austen, of the British Museum, and to Miss Ricardo, who is working at *Tabanidæ*, for the identifications of the specimens I collected, which will be placed in the National collection.

T. gabonensis Macq., Sapele, Odut, Ologbo (S. Nigeria).

T. testaceiventris, Macq., Ologbo (S. Nigeria): Niger River to Muraji (N. Nigeria).

T. nigrohirtus, Ricardo, Warri (S. Nigeria).

T. tæniola, Macq., Egga, Lokoja (N. Nigeria). Eyes dull green.

T. subangustus n. sp. Ricardo, Odut (S. Nigeria).

T. n. sp. *near nigrohirtus*, Ricardo, Lower Niger (S. Nigeria).

T. obscurissimus, n. sp. Ricardo, Uwet (S. Nigeria).

T. thoracinus, Pal. Beauv., Ologbo, Lower Niger (S. Nigeria). Eyes emerald green.

T. fasciatus, Fabr., Baro (N. Nigeria). Eyes coppery green.

T. latipes, Macq., Niger and Kaduna Rivers (N. Nigeria). Eyes deep blue.

T. biguttatus, Wint., Lokoja (N. Nigeria). Eyes dark brown.

T. splendidissimus, Ricardo, Ologbo (S. Nigeria).

T. n. sp. Odut (S. Nigeria).

I first met with *Glossina palpalis* in the Gambia, upon the creeks in the Kommbo province. No flies were seen until we were actually in the mangrove belt and at the water side, when numbers appeared and settled upon our clothes and upon the sides of the canoe in which we travelled. The only animals seen near here were the pack donkeys used for conveying the ground nuts to the creeks for water transport. Although the place where *G. palpalis* was in numbers was not fifty yards from where the donkeys were unloaded, no tsetse flies were attracted to them. After taking off their heavy loads the drivers hammered the muscles of the legs of every animal and pulled the joints, whereupon the donkeys rolled on the grass for a short time and appeared much refreshed. A horse suffering from the fly disease and showing all the usual symptoms was seen at Bakau, where, while examining a swamp, a tsetse fly settled upon me. Unfortunately I did not manage to capture it. In the direction of Brufut large herds of cattle were seen, and, although there were swarms of flies about them, no tsetse were seen. All the cattle were in a healthy state, but were never permitted to go in the direction of the creeks, not very far distant. At York, S. Leone, while waiting for a canoe to cross a tidal creek, Mr. Smythe, Curator of the Botanic Gardens, who was with me, was bitten by *G. palpalis* and his hand swelled to a considerable size. Although I was subsequently bitten on several occasions by *G. palpalis* and *G. tachinoides* in N. Nigeria, no such symptoms appeared in my case. The flight of the unfed insect seems to be generally short and in the form of an upward curve, dropping suddenly near the settling

point; this gives it the appearance of striking the object heavily. I have only met with the two above-mentioned species on, or upon the immediate banks of, rivers and have never seen either feed, unless in shade. Instances of places where one is likely to be bitten by tsetse flies are: inside the trouser leg below the knee, where the fly will creep up to from the boot; inside the half closed hand, upon the palm; close to the hat brim on the forehead or behind the ear. I did not notice that *Glossina* were noisy, nor could I observe any motion of wings while feeding. The occurrence of *G. palpalis* was curiously alternated with that of *G. tachinoides* on some parts of the Niger. In the lower Niger, as far up as Iddah, an almost black form of *G. palpalis* is found, from Lokoja to Baro *G. tachinoides* occurs commonly, from Egga (a few miles beyond Baro) to Muraji (junction of Kaduna river) typical *G. palpalis*, and from Muraji up the Kaduna to Dakoma *G. tachinoides* again was the only species seen. Horses are the usual method of conveyance in N. Nigeria and so long as they are kept away from the rivers do not run the risk of the fly disease. *G. morsitans* was not seen by me in N. Nigeria, but I took it upon the Volta river at about half a mile distant from the water, as well as at a place six miles north of Kumassi towards Aguna, where there was no extent of water. I think that *G. morsitans* has different habits to those of *G. palpalis* and *G. tachinoides*, and may be found at some distance from large expanses of water. Cattle are not kept upon the Volta river, and although I met with some near the place where *G. morsitans* was taken north of Kumassi, I understand that these were being brought into that town for killing, from outside the forest belt in the north. The species taken with their localities are as under:—

G. palpalis, Rob. Desv., Gambia River, York (S. Leone), Kent (S. Leone), Warri, Old Calabar, Lower Niger as far as Iddah (S. Nigeria), Upper Niger, Egga to Muraji (N. Nigeria).

G. tachinoides, Westw., Upper Niger, Baro-Lokoja, Kaduna river, Muraji-Dakomba (N. Nigeria).

G. morsitans, Westw., Pesse, Volta River (Gold Coast); between Kumassi and Ekona (Ashanti); probably also Bakau (Gambia).

NOTES ON SOME OF THE MORE OBVIOUS DISEASE CONDITIONS SEEN ON THE LINE OF THE PROJECTED LOBITO-KATANGA RAILWAY.

By F. Creighton Wellman, M.D.
Benguella, W. Africa.

The writer has from time to time published in these columns notes and papers on the diseases found in this colony, chiefly in the districts of Bihé and Bailundo. The region referred to in the following remarks, however, has not been inspected before, and indeed, so far as I can learn, has never been up to this time visited by a medical man. The most of the observations here recorded were made among the Chiyaka tribe, about 150 miles east of Lobito Bay; and are of necessity concerned mainly with those features which would strike the eye during a hasty survey of the country. It may be possible on some future occasion to present a more detailed study of the region, including results of microscopical examinations of the blood and excreta of series of the natives. The diseases mentioned are placed in alphabetical order.

Abscess of Spleen.—One case seen in which I opened and drained the abscess, the patient recovering very rapidly.

Albinism.—Two cases of complete albinism were noted.

Ainhum (see plate, fig. 9).—Two cases, neither of which showed any symptoms of leprosy.

Deformities.—Supernumerary fingers and toes were twice seen. Probably a better acquaintance with the region would reveal more, as I have seen many such cases in Africa. A case of "Siamese Twins" was reported to me, but I did not see the children personally.

Elephantiasis.—Pretty common among the blacks in the district. However, in my not large series of blood examinations I did not see embryos of *Filaria bancrofti*, although *perstans* was met several times, the man whose leg is shown in the fig. 10 (see plate) being a victim of the infection.

Epilepsy. — Very common. Many cases being brought to me for treatment, some of which showed scars from having fallen into the fire during fits.

Goitre.—Rare. Only one case seen. This region furnishes a marked contrast to the goitre-stricken areas in Bihé district.

Hernia.—Umbilical hernia is as amazingly common as in other parts of the colony. Inguinal hernia not rare. Half a dozen cases came asking for treatment.

Hypertrophy of the Breast in the Male.—A couple of cases seen. The natives are very anxious to have the growths removed, as these subject their possessors to much chaff and ridicule from their companions.

Jiggers.—*S. penetrans* as common as in other parts of the colony.

Keloids.—Common, as among all African blacks.

Leprosy (see plate, figs. 6, 7 and 8).—This disease is much commoner in the region visited than in Bihé and Bailundo districts, and severe cases of long standing were seen; leprosy is as yet comparatively rare in the districts just named.

Malaria and Blackwater Fever.—While I was not able to make in this region many blood examinations, yet both the sub-tertian and quartan parasites were seen. In looking over natives one gets the impression that the amount of malarial fever is about that seen in similar altitudes to the north. Cachexia from this cause (see plate, fig. 12) is about as common as in Bihé and Bailundo. It is interesting to note here that some thirty Boers died of blackwater fever last season at Capalla, a place formerly, I believe, considered to be quite healthy.

Myasis.—While I saw no cases of this condition yet I took many specimens of *Sarcophaga africa*, *S. albofasciata* and *Anthomyia desjardensii*, all of which I have convicted of causing myasis in this colony; besides many specimens of *Auchmeromyia luteola*, the habits of which are now so well known.

"*Ochimumusu.*"—This is a marginal ulceration of the gums common in this colony and in other parts of Tropical Africa. I made the interesting discovery of spirochætes in great numbers in the mouths of each of the several cases seen with the disease in the district under discussion. I failed to find the organism in control cases. I shall deal at length with these observations in a subsequent communication.

Sleeping Sickness and Tsetse Flies.—I am credibly informed that "fly" exists on the Kambanga, Sapa, and Solo rivers, east of Benguella along the proposed line of the railway, also on the Kuvale river and yet farther inland on the lower Cunene. The Boers state that the flies are worst about the middle of the rains (January to March), when buffalo are in the district. Although I have not yet had the opportunity of examining specimens, the fly is in all probability *Glossina palpalis wellmani* Austen, as this is the only tsetse yet found on the west coast south of the Coanza river. At Bimbash, a few hours east of Benguella, a gentleman connected with the railway informs me that nearly all the natives have died of sleeping sickness. I have elsewhere (*Journal of Hygiene*, July, 1906) discussed the probable fact that trypanosomiasis is rapidly spreading in the colony.

Tick Fever. — The "Ochihopio" (*Ornithodoros moubata*) abounds, as elsewhere, in Angola. Reports of natives and colonists here confirm my opinion elsewhere published that tick fever is commoner in the colony than it was a few years ago.

Tumours.—New growths of all varieties seem to be in the district, as elsewhere in this part of the world, fortunately rare. One striking case of tumour of the lower jaw was seen (see plate, figs. 1 and 2).

Ulcers.—These are commoner in the district than in any other region in West Africa known to me. Many of the cases of what the writer has called "subacute tropical phagedæna" go on until the underlying bones are attacked and disorganised (see plate, figs. 3, 4 and 5). In localities where such mild cases of elephantiasis as are shown in figs. 10 and 11 (see plate) are common, there were noticed large numbers of these subacute, deep-eating ulcers. Taken together with the apparent absence of *F. bancrofti* from the district, this fact suggests that the same bacterial infection may be responsible for both conditions.

Yaws. — Commoner than in Bihé and Bailundo. Spirochætæ were found in two cases; but, as the writer's investigations on this disease as it occurs in the colony are soon to be published in an official report, details need not be entered into at this time.

Explanation of Plate.

Figs. 1 and 2.—Tumour of the lower jaw.

Figs. 3, 4, and 5.—Subacute Tropical Phagedæna. (Fig. 3, a case of long standing, resulting in necrosis and fracture of the tibia. The end of the bone may be seen in the lower part of the ulcer. Fig. 4, a typical sore on the shin, also with extensive bone necrosis. Fig. 5, a piece of bone removed from the latter).

Figs. 6, 7, and 8.—Leprosy. (Fig. 6, a typical case with classical symptoms, *main-en-griffe* well shown in hands; characteristic lesions of feet, &c. Fig. 7, case with characteristic spots and patches on legs and abdomen; but these do not show well in the photograph. Fig. 8, feet of latter).

Fig. 9.—Ainhum.

Figs. 10 and 11.—Elephantiasis of the legs; early stage.

Fig. 12.—Malaria Cachexia.

TWO CASES OF FRONTO-NASAL CEPHALOCELE.

By Alexander Robertson, M.B., C.M.
Gilbert Islands Protectorate.

Ten Tekonapa, male, aged 2, admitted to Tarawa Hospital on account of tumour of the head.

Present State.—The patient is a hydrocephalic child, and does not exhibit any signs of intelligence. In the fronto-nasal region is a tumour about the size of a small rock melon, containing fluid. The weight of the tumour interferes greatly with the movements of the head, the child requiring to support the tumour in his hands. Lateral nystagmus is present in both eyes. Above the right ear, in the line of the fronto-parietal suture, is an irregular scar, an inch in length.

History.—The mother states that at birth there were two swellings, about the size of a hen's egg, on the child's head: one above the right ear, where the scar now is; the other at the root of the nose. The former burst a few months after birth; the latter gradually increased in size until it attained its present dimensions.

Operation.—Under chloroform, the skin was dissected from the tumour by means of an inverted T-shaped incision. A small aspirating needle was then introduced, and twelve ounces of clear cerebro-spinal fluid slowly drawn off. During the escape of the fluid there was no tendency to syncope, nor any appearance of blood in the exudate. Digital examination showed the absence of the glabella and the horizontal plate of the ethmoid, and marked separation of the nasal bones. The sac was then transfixed and ligatured close to the skull, and the distal portion removed. The skin incision was closed by interrupted catgut sutures. The child made an excellent recovery from the operation.

Nei Naua, female, aged 10, admitted to Tarawa Hospital on account of tumour at root of nose.

Present State.—There is a cystic tumour in the fronto-nasal region about the size of a duck's egg. It is covered by skin, which is adherent, and contains some firm, elastic substance; no cerebral pulsation is detected in this mass.

Operation.—Under chloroform, a vertical incision was made over the tumour and the skin reflected. The cyst was then incised and examined. The wall was composed of fibrous tissue $\frac{1}{8}$th of an inch thick, its inner surface being smooth and glistening. There was no cerebro-spinal fluid present. At the bottom of the cyst was a greyish mass, 2 ins. broad and $1\frac{1}{2}$ ins. thick, the outer portion firm and fibrous, the inner soft and compressible; deep pressure elicited a faint pulsation. In order to reduce the deformity as much as possible, I removed the outer portion of the mass in successive layers till I reached a point $\frac{1}{4}$th of an inch from the opening in the skull, produced by the separation of the nasal bones and the absence of the glabella; the horizontal plate of the ethmoid, in this case, was also absent. The redundant sac and skin were then ablated, and the wound closed by catgut sutures. The wound healed by first intention.

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A NEW ASPECT IN THE PATHOLOGY AND TREATMENT OF LEPROSY.

ROBERT SINCLAIR BLACK, M.A., M.D.Edin., D.P.H. Aberd., Government Medical Officer, Cape Colony, contributed a thoughtful and suggestive article on the pathology and treatment of leprosy to the *Lancet* of October 20, 1906. It is doubtful if any communication in regard to leprosy since the discovery of the *Bacillus lepræ* has approached in importance the suggestions and clinical observations advanced by Dr. Black. Being clinical notes for the most part, and therefore unlikely to appeal to the advanced laboratory schools of the day, there is danger of his observations being overlooked. Dr. Black has for several years been attached to the Leper Asylum on Rodden Island, Cape Colony. In 1897 Dr. Kolle, of Berlin, commenced investigations on leprosy at Rodden Island, and directed Dr. Black's attention to the importance of the nasal passages in the clinical history and phenomena of leprosy. Working on the lines suggested, Dr. Black has arrived at important conclusions, which are at once of scientific and practical interest.

Regarding all varieties of leprosy as due to a common cause, and belonging to a single specific disease, Dr. Black found difficulty in accounting for the pronounced difference in the course and behaviour of the two well-marked varieties, viz., maculo-anæsthetic and mixed or nodular leprosy. The former seemed the more mild form of the disease, causing less disfigurement and running a much longer course; the latter appears more virulent as regards disfigurement, rapidity of development, and fatality.

He observed that (1) rhinitis is a prominent feature of almost all (or probably all) cases of leprosy in the early stages; (2) the *B. lepræ* is met with in the nasal secretion of lepers in almost all (or possibly all) early cases; (3) in mixed and nodular leprosy the nasal secretion is excessive, and the bacilli present in numbers in the secretion; (4) in maculo-anæsthetic leprosy the nasal secretion is slight, and the bacilli fewer or absent; (5) in some mixed and nodular leprotic cases, when the nose had fallen in, copious nasal secretion lessened, and the disease became practically of the mild form attendant upon maculo-anæsthetic leprosy. He concludes from these observations: (1) That the maculo-anæsthetic is a mild form of leprosy attended by an early manifestation of a nasal ulcer, with some nasal secretion in which the *B. lepræ* is present, but from which the bacillus disappears in time, owing to the nasal ulcer healing, and the nasal secretion lessening or wholly drying up; (2) that mixed or nodular leprosy is attended by extensive ulceration, and a growth of granulation tissue in the nasal mucous membrane extending from thence into the naso-pharynx and to the cavities which communicate with the nose, thereby leading to distortion of the features. The nasal secretion in such cases is copious and charged with large numbers of the *B. lepræ*. As regards manifestations, Dr. Black is of opinion that mixed nodular leprosy is simply maculo-anæsthetic leprosy plus the infiltration and œdema of the subcutaneous tissues in various parts of the body, caused by the more active *invasion of the B. lepræ*.

"I think that there can be hardly any doubt that leprosy in its early stages begins as a small ulcer on some part of the extensive nasal mucous membrane. We know quite well from our clinical experience of the disease that leprous ulcers in favourable circumstances tend to heal. There can therefore be little doubt that a person can suffer from a leprous ulcer in the nose that may heal and pass entirely away. This is the explanation of the maculo-anæsthetic cases. They have had nasal ulceration which has passed away, in some cases leaving perhaps a cicatrical shrinking of the nasal septum, but during the time the ulcer existed leucocytes or white connective tissue corpuscles got detached from the ulcerating spot and along with the bacilli which they were attempting to devour were carried by the blood stream and lodged in various situations in the peripheral nerves, where they got entangled, and the bacilli then proceeded to grow, causing pressure on the fine nerve fibrils, and consequently setting up nutritive changes in the skin which these axis-cylinders supplied, thus causing the patches of discolouration and anæsthesia."

"In the nodular and mixed cases the progress of the disease is quite different. Instead of the nasal ulcer healing up it proceeds to grow apace, causing extensive destruction of the nasal mucous membrane, causing it to swell up and ultimately attacking the nasal bones themselves."

Dr. Black's observations help us to understand with something like precision the difference between mild and severe forms of leprosy, and to draw attention to the nose as being probably the primary focus of infection and the seat of the primary ulceration. The early rhinitis assumes an importance hitherto disregarded, for in the recognition of this seemingly trivial nasal catarrh may lie the key of the problem. It is seldom lepers apply for medical treatment whilst merely the symptoms of an excessive cold are in progress; did they do so, the examination of the secretion for *B. leprœ* would clear up the diagnosis and give opportunity, were the bacillus found, of treating leprosy by rational methods. There is no reason why the festering nasal sore, which is the real cause of the complaint, should not be attacked by curetting, by nasal douches and by other means, so that the source of infection may be done away with, or the potency of infection diminished. Even in more advanced cases the treatment of the nasal condition affords some hope of doing good and limiting or preventing further infection of the body generally by the destruction of the infecting organism at its source. Dr. Black has placed the treatment (and the phophylaxis) of leprosy on a rational plane; he has raised it from the mere "treating of symptoms as they arise," and of empiric treatment generally to a rational if not to a scientific platform; he has brought hope to the leper, and has taught us to divorce leprosy from the mystery which surrounds it, and to rank its manifestations alongside of other ailments arising by primary sores and other foci of infection.

SANITARY ORGANISATION IN INDIA.

THE Committee that met at Simla to consider the constitution of the new service of sanitary engineers has completed its work, and its recommendations will now be considered by the Government of India. The result of its deliberations will be awaited with keen interest by all concerned in the sanitary administration of our great dependency. We trust, however, that the new engineering experts will be made part and parcel of the department under the direction of the Sanitary Commissioners with the Government, and not form a sort of *imperium in imperio*, responsible only to the heads of the Department of Public Works. Up to comparatively late years, sanitation in India could hardly be said to be anything more than domestic sanitation on a large scale, and the technical questions involved fell easily within the powers of the ordinary medical graduate in sanitary science, but the growing necessity to deal with our great Indian cities on European lines has altered all this, and at the present day large sanitary engineering works are constantly in progress in every province.

The large waterworks which have been built during the last decade first brought the necessity of the entertainment of engineering specialists to the front, and most of these undertakings already possess a resident engineer, which for some years most provinces have possessed a consulting engineer in this branch, but these officials have been either municipal servants or attached to the department of public works, and hence, though practically forming an integral part of our sanitary administration, have been of it, but not in it.

Benares is already provided with a system of sewerage on modern lines, and there can be no doubt that ere long the same must be done for our other great cities. The local peculiarities of Oriental towns differ, however, so markedly from those of Europe, that experience gained in the one field, however valuable, cannot qualify a man to take up, off hand, work in the other, and it is probably owing to this that the Government is now proposing to institute a special service of sanitary engineers. Any such accession of strength should, however, be made a part of one department, working along with the medical specialists under the direction of the Sanitary Commissioner. The training of a sanitary engineer, however able he may be, does not qualify him to decide what measures will be best suited to maintain the public health, any more than that of the medical graduate in sanitation makes him a judge of the best section and gradient for a sewer, or of the relative merits of different patterns of sluice valve.

The medical sanitarian, in fact, knows best what should be done, while his engineering colleague alone understands how to do it. The question of what to do remains, however, the consideration of primary importance, and unless this very obvious fact is kept well in mind by the Government there will be a grave risk of the Sanitary Commissioner being reduced to a cypher in the decision as to what measures should be adopted. To give a possible instance: The relative merits of septic tanks as compared with intermittent ærobic filtration, and their relative applicability to local needs, are questions for the medical expert; their construction, when decided upon, that of the engineer; but unless the medical element be given the key of the position, it may be taken as certain that the man best qualified to judge as to the health requirements of a locality will have but little voice in determining what plan should be selected.

The provincial sanitary committees were, and it is believed still are, composed of the head of the Provincial Department of Public Works, the Consulting Sanitary Engineer, the Inspector-general of Civil Hospitals, and the Provincial Sanitary Commissioner, a constitution which, it will be observed, in case of a difference of opinion between the engineering and medical elements, leaves the parties equally divided, and hence throws the ultimate decision on the executive authorities, who cannot be expected to understand much of the relative merits of either point of view.

Now, in practice those who have sat on such Committees know too well that it is extremely difficult for the medical members to carry into effect their views on the proposals brought before the Committee. A new meat market, for example, is projected for some town, and the engineers bring before the Committee plans, the preparation of which represents much trouble and expense, but which are obviously ill suited to the purpose, from the public health point of view, owing to ventilation being insufficiently provided for. The carrying out of the medical members' modification would involve the preparation of com-

pletely new plans, and probably spoil the architectural effect of the building. Assuming that the medical members stand to their guns, an attitude which involves much trouble and correspondence, the decision necessarily rests with the Lieutenant-Governor, who, as likely as not, argues that a sanitary engineer ought to know as well how to plan a meat market as any "doctor," and the result is at best the concession of a few utterly inadequate additional openings, and a building quite unsuited for the purpose for which it is designed, while the medical members are condemned as being impracticable and "wanting in tact." While, therefore, welcoming the proposed accession to the strength of our Indian sanitary forces, we trust that Government will take care that the engineering element shall be the helper, but not the master, of the Medical Sanitary Authorities.

LEPROSY IN COLOMBIA.

THE report that there were 30,000 lepers in a population of 4,000,000 in the Republic of Colombia, South America, is denied by the Colombian officials. The Consul General in London states there are but 5,000 lepers in a population of 5,000,000.

The leper settlements in Colombia are at Agua de Dios, Cano del Loro, and Contratacion; the last-named is to be removed to Capitia at an early date.

The Colombian Government are taking steps to place these three settlements in a thoroughly hygienic state.

Miscellaneous.

FIGHTING TROPICAL DISEASE.

A HANDSOME DONATION TO THE LIVERPOOL SCHOOL OF TROPICAL MEDICINE FROM H.M. THE KING OF THE BELGIANS.

HOME SCOURGES PREVENTABLE.

A COMPLIMENTARY luncheon to Professor Ronald Ross, C.B., Professor R. Boyce, and Dr. J. L. Todd (in recognition of the decoration recently conferred on them by His Majesty the King of the Belgians for services in research into tropical diseases at the Liverpool School of Tropical Medicine), was given by the Lord Mayor of Liverpool (Alderman Joseph Ball) on October 1st, at the Town Hall, Liverpool. The following was the list of acceptances: Lord Mountmorres, Sir Alfred L. Jones, the Lord Provost of Edinburgh (Sir Robert Cranston), Sir James Barr, Mr. George Brocklehurst, Mr. W. Adamson, Alderman F. Smith, Mr. T. F. Harrison, Professor Moore, Mr. A. R. Marshall, Mr. W. Roberts, Dr. Evans, Colonel Frank Walker, Alderman E. Walker, Mr. Henry Jones, Dr. Nisbet, Alderman W. Hall Jowett, Mr. W. J. Bellis (Chairman of the Junior Reform Club), Mr. W. Muirhead (Chairman of the Junior Conservative Club), Mr. T. H. Barker, the Belgian Consul (Mons. E. Seve), Mr. C. Livingston, Dr. Caton, Mr. F. C. Danson, Mr. R. W. Leyland, Alderman M. Hyslop Maxwell, Mr. A. H. Milne, Colonel Dobson, Mr. Ellis Edwards, Alderman C. H. Giles, Mr. A. Lawrence, and Mr. J. Gaffney. The Police Band played during the reception and repast.

After the loyal toasts had been duly honoured, the Lord Mayor, in proposing "Our Guests," said he had asked these three distinguished gentlemen to accept the hospitality of the Town Hall because he considered that honour should be paid to whom honour was due. Under the auspices of the Liverpool School of Tropical Medicine, Professor Ross, Professor Boyce, and Dr. Todd had undertaken the investigation of sleeping sickness, towards which work the King of the Belgians contributed a sum equal to £4,000 English. Having been satisfied with the work which was so effectively done and of such great value, His Majesty conferred upon these gentlemen a decoration of a personal character. He was sorry that Professor Boyce was not present. He had hoped to have attended this complimentary luncheon, but his doctor forbade him to travel from Harrogate. Proceeding, he remarked that Professor Ross had just received the honorary degree of Doctor of Law at Aberdeen University, while in 1902 he was awarded the Nobel prize for his discoveries in malaria. Dr. J. L. Todd was a medical graduate of M'Gill University, Canada. He had participated in several very important expeditions of the Liverpool School of Tropical Medicine, and had been identified with the late Dr. Dutton in carrying out the extensive study of sleeping sickness. Professor Boyce was the Dean of the Tropical School, which owed its inception to Sir Alfred Jones' and Professor Boyce's energy. As Chairman of the School of Tropical Medicine, Sir Alfred Jones had brought to bear great business capacity, much foresight, unbounded generosity, and an amount of enthusiasm, without which the work would have lacked much of its force. The Tropical School had only been in operation since 1899, and by 1905 £48,200 had been collected. Never was money more profitably spent than this £48,000. Sixteen expeditions had been sent out to tropical and sub-tropical countries. About 900 cases of various tropical diseases had been treated at a special ward in the Royal Southern Hospital, Liverpool, and he was glad that they had the Chairman of that hospital (Mr. Wm. Anderson) with them that day. Moreover, they were honoured with the presence of the Belgian Consul, and through him he begged to assure His Majesty the King of the Belgians of Liverpool's warm appreciation of his gracious act.

Sir Alfred Jones, in cordially seconding the toast, read a translation of a letter from the Secretary-General, Congo Free State, dated Brussels, September 28th. It stated: "You made reference to the fact that if his Majesty Leopold II. would consent to make an annual subscription of £1,000 for a period of five years, the Liverpool School of Tropical Medicine would be relieved of pecuniary difficulties. I have the honour to inform you that his Majesty the Sovereign King, responding to this appeal, has authorised me to place at your disposal a sum of £1,000. We hope that this subscription will not be the last which might be made to the institute."

A letter was read from Professor Boyce, who said the honour to himself and his colleagues was really paid to the Liverpool School of Tropical Medicine.

Professor Ross, in response, remarked that he had been previously honoured at the Town Hall during the Lord Mayoralty of Mr. W. Watson Rutherford, M.P. He should not only like to see all tropical diseases banished, but likewise all preventable diseases at home, such as measles, scarlet fever, and chicken pox. He believed that by the discovery of the causes such diseases could all be wiped out.

Dr. Todd, likewise acknowledging the toast, drew attention to the proposed memorial to Dr. Dutton, who had left a glorious example of self-sacrifice.

The Belgian Consul expressed, in the name of King Leopold and his fellow-countrymen, their congratulations on the success of the Liverpool School of Tropical Medicine, which was known all over the world.

The Lord Mayor, again rising, said: I should not like to part without asking you to drink the health of the Lord Provost of Edinburgh (Sir Robert Cranston, K.C.V.O.). His lordship has come to Liverpool to attend a church function in Everton, and I embraced the opportunity of inviting him to join us at luncheon to-day. If I mistake not, he will have been very much interested in all that has passed to-day. I venture to hope that the seed thus sown in his mind will ripen and bear fruit. We are not using Sir Robert as a medium for collecting money—the thought farthest in our minds—but we should like him, when he gets an opportunity in his own city, in which he is so respected and has so much power, to sing the praises of the Liverpool School, which is doing so much to reduce the diseases brought about by malaria. The more we can make known this fact the better it is for the world. We are not working on our own account, but for the good of humanity—helpless humanity. Gentlemen, the health of the Lord Provost of Edinburgh.

The Lord Provost, in reply, said Scotland was a poor country, but it would appreciate what the Lord Mayor had said. He agreed that municipalities should try to discover the causes and to eradicate preventable disease.

Sir James Barr gave "The Lord Mayor," and with his lordship's response the pleasant proceedings were concluded.

The Lord Mayor directed that the following telegram should be sent to King Leopold: "Grand Marichal de la Gour, Brussels.—Please convey to his Majesty the King of the Belgians the very hearty thanks of myself and the School of Tropical Medicine for the decorations conferred upon Professors Ross, Boyce, and Todd, and our warm appreciation of his Majesty's generous donation towards the noble work of stamping out disease. Am now giving luncheon party in honour of the three professors, and we present our respectful thanks to his Majesty.—From the Lord Mayor of Liverpool."—*Liverpool Post*, October 2nd, 1906.

Reviews.

THE PRINCIPLES OF TREATMENT AND THEIR APPLICATION TO PRACTICAL MEDICINE. By J. Mitchell Bruce, M.A., M.D., LL.D., F.R.C.P. Third Edition. Edinburgh and London: Young J. Pentland, 1905. (Demy 8vo, pp. 614.)

We have only had a few books in medical literature during the past century which can be said to approach the grade of classical literature. Symes' Principles of Surgery, Huxley's Physiology, and Watson's Medicine, are, perhaps, the most outstanding books of the kind, and were we to link the earlier editions of Druitt's Surgery, and Erichsen's Science and Art of Surgery with these, the list may be said to be completed. The Principles of Treatment, by Dr. Mitchell Bruce, revives the hope that the writers of to-day can approach these classical writers, and even surpass several. The Principles of Treatment, by Dr. Bruce, may legitimately be classed along with Symes' Principles, and higher praise cannot be bestowed upon any medical work. It is, moreover, encouraging that the book has reached a third edition, as it proves that medical men, in the multiplicity of books and periodicals, have not altogether lost taste for the classical in medicine. Every medical man who has a regard for the ideal in medicine and in the treatment of disease, has Bruce's Principles of Treatment on his shelf.

Correspondence.

THE IMMUNITY OF NEGROES TO VARIOUS FORMS OF CANCERS.

To the Editors of the JOURNAL OF TROPICAL MEDICINE.

GENTLEMEN,—Permit me to ask, through your pages, whether any of your readers have observed epithelioma of skin or rodent ulcer in negroes? During twelve years' practice I have only once seen this disease in one negro, and in this case the patient is an albino. Unfortunately, I have not yet persuaded him to allow its removal, though he promises to. My father, Dr. W. J. Branch, after forty years in the West Indies, has admitted to me that he cannot recall a single instance of this cancer in a black person. Cauliflower cancer of the cervix is the only epithelioma that in my experience affects West Indian negroes, and I have practised in six islands and have some acquaintance with several others. Among the poor whites, rodent ulcer and epithelioma of the lip are decidedly common.

If this exemption of the black skin from malignant disease is borne out by the experience of others, it is curious that more attention has not been directed to the phenomenon.

Yours, &c.,

C. W. BRANCH, M.B., C.M.

St. Vincent, British West Indies.
September 28th, 1906.

SCHAUDINN MEMORIAL.

THE FRITZ SCHAUDINN MEDAL.

IN memory of Fritz Schaudinn, the famous Protozöologist, who enriched our knowledge by many discoveries, one of which was the cause of syphilis, there

will be presented, on the anniversary of his all too early death, a medal to the author of the most remarkable work on Microbiology. At present it is intended that the medal shall be given once every two years, and the presentation will take place through the medium of the Institut für Schiffs-und Tropenkrankeiten at Hamburg, on the staff of which Schaudinn worked before his death. It was ever his desire that protozöology should be considered to be, like bacteriology, a part of microbiology, in any department of which work worthy of the medal may be done. The necessary funds are already guaranteed, and care will be taken to secure the co-operation of scientists of all lands in the decision as to the worker best deserving the medal.

[We are glad to know that Schaudinn and his brilliant work is to be commemorated in a suitable fashion. We are obliged to the authorities of the Seemans Krankenhaus und Institut für Schiffs-und Tropenkrankheiten, Hamburg, for the above notice.—Ed. *J.T.M.*]

Dear Sir,—As you may perhaps be aware a movement has recently been set on foot in England to co-operate with Germany in forming a Memorial Fund for the wife and children of the late Fritz Schaudinn, of Hamburg. The list of the achievements of this eminent investigator is a long and distinguished one, and includes not only discoveries of the highest theoretical importance, but also many of practical application to disease as in the case of his well-known researches on amæbic dysentery and malaria. The last, and perhaps the chief, of his achievements, viz., the discovery of the micro-organism of syphilis, was made just before his death, and is still fresh in the public mind. The enclosed circulars indicate sufficiently, I think, the need for the formation of such a Memorial Fund.

Since the present state of international feeling renders it desirable that this British tribute of admiration to a great German should be as weighty as possible I have ventured to send you a copy of the appeal. I need scarcely add that the addition of your name to the Committee will be a valuable accession to its strength.

I am, &c.,
W. S. Perrin.
(*Hon. Sec. of the Committee.*)

The Museums, Cambridge.
October 12*th*, 1906.

SCHAUDINN MEMORIAL

[*Translation.*]

Dear Sir,—As I already informed you our Schaudinn was released from his sufferings on Friday morning last. His condition from the moment he came under medical treatment not only gave occasion for the gravest apprehensions, but was regarded as almost hopeless by the physician, ... For weeks we lived between hope and fear without suspecting how serious matters were with him. Now he is taken away from us. What we have lost in him you know. The distress is so much greater in that we have no adequate substitute for him. Whether Protozoology, which had begun under his guidance to develop so brilliantly, will become without him what he promised to create for it, the future will show. But the blow has struck those he has left behind hardest of all his poor young wife, who expects within a few weeks the birth of a third child, and his two little children, a girl and a boy. They have all lost in their father their only support. The state of Hamburg of course pays a widow and orphan pension and will assess this as highly as the legal definitions in any way permit. In spite of this it can only be a modest one, since Schaudinn died so young, little more than £100 for the widow and £25 for each of the children. It will thus be of value to render private assistance, *i.e.*, to collect together some kind of memorial fund. An appeal, which it has been decided to publish, will address itself chiefly to the medical profession, and we are reckoning upon the dermatologists taking a prominent part. Among these Neisser, and others, have already promised their assistance. In addition a special grant on the part of the Prussian and Imperial authorities is hoped for. I should, however, think that the interest in Schaudinn abroad will not end with his life, but that people will gladly give proof of their high esteem for the dead to his family, which he has left behind in grief and necessity, by taking part in the work of love.

I therefore approach you with the request to open among your countrymen the matter, which now occupies all the friends of the dead, and which we can scarcely bring to the desired end through our power. I intend to apply to my friend Minot in America, and Blanchard in France, with the same request. In carrying out the plan I should much prefer to personally remain completely in the background; naturally, however, I place myself completely at your disposal with respect to any further information that may be desired.

Giessen, J. W. Spengel.
June 28*th*, 1906.

Dear Sir,—The enclosed letter has been received by Mr. Sedgwick from Professor Spengel, of Giessen.

It is proposed to co-operate in the movement which has been set on foot in Germany by forming a Committee of scientific men interested in Dr. Schaudinn's work. A list of the gentlemen who have already signified their approval of this scheme and have consented to join the Committee is now sent you. I have the honour to ask you if you will allow your name to be included in their number.

Subscriptions may be paid to Mr. Adam Sedgwick (at the above address), Treasurer of the Fund, or direct to the Schaudinn Memorial Fund at Messrs. Barclay and Co.'s Bank, Cambridge.

I am, &c.,
W. S. Perrin,
Hon. Sec. of the Committee.

New Museums, Cambridge,
July 14*th*, 1906.

Committee.—Professor Clifford Allbutt, F.R.S., Sir Michael Foster, K.C.B., F.R.S., Mr. Jonathan Hutchinson, F.R.S., Professor E. Ray Lankester, F.R.S., Sir Patrick Manson, K.C.M.G., F.R.S., Professor William Osler, F.R.S., Mr. John Tweedy, President of the Royal College of Surgeons, Professor Sims Woodhead, F.R.S.E.

The following subscriptions have been received or promised:—

	£	*s.*	*d.*
The Right Hon. Lord Lister ...	20	0	0
Mr. A. Sedgwick	1	0	0
Mr. J. J. Lister...	5	0	0
Professor Sims Woodhead ...	5	0	0
Dr. J. Hutchinson	5	5	0
Mr. A. E. Shipley	1	1	0
Professor W. Osler	5	5	0
Professor T. Clifford Allbutt ...	2	2	0

[It is to be hoped that medical men in practice in the Tropics, in view of the great advance in our knowledge of tropical diseases due to Schaudinn, will subscribe to the Schaudinn fund.—Ed. *J.T.M.*]

Books and Papers Received.

"The Prescriber."

We are favoured with the first number of a new monthly publication devoted to the pharmacy of the newer remedies, termed *The Prescriber*. The periodical is edited by Thomas Stephenson, F.C.S., Ph.C. A journal specially devoted to prescriptions and prescribing would be popular with medical men. We will await the development of the journal with interest, and hope that prescriptions and prescribing, as well as pharmacology, will find a place in future numbers. The journal is published in Edinburgh.

Notes and News.

Mr. Andrew Carnegie has given £10,000 to build a library for the University of St. Andrew's, of which University he is Lord Rector. Dundee University College also benefits by the sum of £12,500 given by the same generous donor for the purposes of a public laboratory.

Brussels School of Tropical Medicine.—King Leopold opened the School of Tropical Medicine at Brussels, on October 13th. The School was founded by King Leopold, who has for many years appreciated the importance of the investigation of diseases in his tropical possessions and colonies. The Director of the School is Dr. van Campenhout, formerly the Superintendent of the Colonial Sanatorium at Watermael. Although the investigation of sleeping sickness will take a prominent place in the immediate investigations to be carried on at the School, instruction will be provided in all departments of tropical medicine. The links of sympathy and practical interest which already exist between the schools of tropical medicine in London, Liverpool, Paris, and Hamburg, will extend to the new school in Brussels, and it is to be hoped the several schools will still keep touch with each other in the future as they have done in the past.

Sir Frederick Treves' interesting book, "The other Side of the Lantern," published by Cassell and Co., London, is re-issued in a "popular" edition. "The other Side of the Lantern" is a graphic and personal account of what the writer saw and noted in his journey round the world. It is written in the terse and enlivening style characteristic of all Sir Frederick Treves writes and does.

It is probable that Major Bird, C.I.E., Professor of Surgery in the Medical College, Calcutta, will be appointed Medical Officer in attendance on the Amir during His Highness's tour in India. Major Bird, it may be remembered, was highly successful at Kabul in treating injuries to the Amir's hand caused by an accident while shooting.—*Pioneer Mail*, September 14th, 1906.

In spite of some inexplicable opposition from the Rangoon Chamber of Commerce, a branch of Lady Minto's scheme for an Indian Nursing Association is to be established in Burmah, and no country stands in more urgent need of an efficient organisation of the kind.

The first report of the health officer of Rangoon is couched in a somewhat desponding vein, and it cannot be denied that the rat-killing operations have, as yet, not proved a particular success; but this is probably because the business has been taken up in a very half-hearted fashion. It stands to reason that, to be effectual, the campaign against rats should be conducted simultaneously throughout the entire town, and this does not appear to have been as yet attempted in Rangoon. Rats are notorious for their sagacity, and, it is well known, migrate at once should any considerable mortality occur among them, whether brought about by plague, poisoning, or any other cause. The result, therefore, of partial attempt is merely to spread the disease to quarters of a town that have been left untouched.

A fashionable wedding took place at Rangoon on September 6th, between Miss Linda Wilkins, daughter of the popular P.M.O., of the Secunderabad Division, and Lieut.-Colonel Menzies, Rangoon Port Defence Volunteers. The ceremony was conducted by the Right Rev. the Bishop of Rangoon.

A course of not less than four lectures on the prevention of disease will be delivered annually at all stations where British troops are quartered. Whenever practicable, the dates selected for the lectures will be between April 1st and October 31st. The lectures will be delivered by Royal Army Medical Corps Officers, who will be selected by the General Officers Commanding Divisions and Brigades, with special reference to their fitness for dealing with the subject. Attendance at the lectures will be voluntary, but General and other Officers Commanding should impress on those under them the importance of acquiring some knowledge of this subject. The first series of lectures commence this month. This is a most excellent innovation, as there cannot be the least doubt that a large proportion of sickness in India, alike among Officers and men, is entirely due to ignorance of the precautions that should be adopted by all reasonable persons in such a climate.

X-ray installations will shortly be introduced at ten central stations in India for army purposes. So far so good: as far as those quartered at these particular stations are concerned; but what about the large majority who are posted elsewhere? This means that at all other than these central stations, any case that may occur must needs await diagnosis until, in response to a proper official requisition, with an appropriate width of "margin," the apparatus is despatched to the outstation, a procedure that must often involve a delay of several days at the most critical period of a case. Although rather expensive, an X-ray apparatus is not costly enough to warrant so pitiable and misplaced an economy, and as many

private practitioners can provide themselves with one, Government can surely afford these appliances to each station, for at the present day an outfit of the sort has become one of the necessities of surgical life.

Two successful cases of treatment of snake-bite by the combined use of antivenene and the local application of permanganate, are noted in the annual report of the Sanitary Commissioner of the Central Provinces, India. In both cases a ligature had been applied immediately after the bite, and in one of them two hours elapsed before any other treatment could be adopted.

It is understood that the Government of India have appointed a Committee, consisting of Lieut.-Colonel Leslie, I.M.S., Sanitary Commissioner with the Government of India, Mr. Lionel Jacob, Secretary to Government in the Public Works Department, and Mr. D. Aikman, to draw up a scheme for the creation of a service of sanitary engineers as a separate branch of the Public Works Department. The Committee will draw up the regulations and conditions of service, &c. —*Pioneer Mail*, September 14th, 1906.

The death is announced of Captain F. A. Pilkington, I.M.S., of heart failure. The deceased officer was well known and highly esteemed in Lahore.

On November 9th, 1906, Professor Ronald Ross, F.R.S., C.B., will give an address on the subject of "Malaria in Greece," to the Medical Society of Oxford.

X-ray Burns.—In a discussion on the treatment of X-ray burns at a recent meeting of the New York Dermatological Society, as reported in the *Journal of Cutaneous Diseases*, Dr. Henry C. Piffard, Emeritus Professor of Dermatology in New York University, said that he had "obtained the most benefit in treating X-ray burns with antiphlogistine, chloride of zinc, high frequency current, and ultra violet rays."

Owing to the rapid spread of the cocaine habit in India, the Punjab Government has issued a notification under the Excise Act that cocaine, and every preparation and admixture of cocaine, are henceforth included in the definition of "intoxicating drinks." This will give the authorities the same powers of regulating the sale of the drug that they possess in the case of opium, Indian hemp or alcohol.

Some time ago it was pointed out in "Notes and News," that the Hindu population in India would probably raise objections to the killing of rats, and already one can hardly take up an Indian paper without finding allusions to this difficulty, which constitutes the greatest obstacle to the efficient carrying out of this most practical of anti-plague measures. In Nagpur, the capital of the Central Provinces, a *Guru*, or Hindu religious leader, has been preaching against the sin of killing rats, and on being asked by Mr. Dewar, the Executive civil officer, what he thought of tiger shooting, the *Guru* replied that that was not a sin, but a duty. Mr. Dewar pointed out that at present rats were destroying far more human lives than tigers had ever done; but common-sense and reason weigh so little with religious fanatics of any denomination that it may be feared that his most apposite parallel had little effect on the Guru's crusade. Accordingly, Mr. Ram Narayan, an influential native banker, proposes to provide a "rat-ruksha" or sort of pen in which the captured rats may be confined as pensioners for the natural term of their lives, the male and female animals being kept apart. To the home-staying European, all this appears too "Gilbertian" for grave consideration, but the proposal has been most gratefully received by Major Buchanan, I.M.S., who is in charge of the plague operations, and the thanks of all interested in Indian sanitation are due to Mr. Ram Narayan for a proposal which smooths the way over what bids fair to become an insuperable *impasse*. In the Punjab, on the other hand, the campaign against rats progresses steadily, and does not appear to be rousing opposition. Already nearly sixty towns have been included in the operations.

An instance of the dangers attendant on the storing of grain in hot, damp climates, comes to us from Bangalore, where a serious outbreak of diarrhœa, which raised suspicions of the presence of cholera in the town, was traced to this cause. The stale corn was disposed of by mixing with sound grain in sufficient proportion to mask the musty odour of the decomposed article.

A professor of Biology is to be added to the staff of the Lahore Government College.

We learn that Lieutenant F. H. Stewart, I.M.S., who recently applied to Government for the post of Surgeon Naturalist, Marine Survey of India, has been posted to Gyantze, Thibet! The fact of the would-be deep sea fisher being sent to sit on the top of mountains 12,000 to 15,000 feet high needs no comment.—*Pioneer Mail*, October 5th.

The contributions to Lady Minto's endowment fund for European-trained nurses now amounts to over £8,000.

The *Pioneer Mail* of October 5th includes a useful review "by a specialist" of the measures that have hitherto been adopted for the suppression of plague, in light of our more recent knowledge as to the mechanism of its conveyance. He shows how the failure of protective cordons was inevitable, evacuation merely a palliative, and why disinfection, in the ordinary sense of the term, is worse than useless. Inoculation he regards as needless, in view of the fact that plague may now be regarded as though *the most troublesome of all our epidemics, it is the most easily preventable*. While in no way minimising the obstacles of native prejudices against rat-killing, he believes that the opposition will die down "as soon as the people understand that plague is primarily a rat disease." In one point we would, however, wish to set our contemporary correspondent right in a matter of history, when he says:— "Men were employed to disinfect houses, and a con-

siderable number of those who were employed on this work were attacked by plague. Boots and putties were provided for these workers, and with good results, but it probably never occurred to any one that the boots and putties produced their good effect by preventing the workers from being bitten by rat fleas." Now, as a matter of fact, ammunition boots with pyjamas tucked into them at the ankle, were ordered to be worn by the men of the disinfecting gangs, by the Sanitary Commissioner of the North West Province and Oudh in 1899, because the holder of the appointment at that date held a firm belief that some insect such as the bed-bug or the flea would ultimately be proved to be the actual carriers of the disease, in spite of the discredit that then was thrown on the idea by bacteriologists, and he further directed that the boots as well as the legs and arms of the men engaged in the work should be kept greased with carbolic oil on account of the well-known aversion of fleas and other insects to greasy and strongly-smelling substances. The theory, it must be remembered, is a fairly old one, and although the triumph of the truth is but so recent a matter, the idea had even then already occurred to Lieutenant (now Captain) Glen Liston, although he did not publish any note on the subject till long afterwards. The certainty of our knowledge, and the conviction that, given intelligent co-operation on the part of the populace, plague is an easily controllable disease, is, however, a pleasant contrast to the groping in the dark of those days; for even those of us who most strongly held that plague must be conveyed by the agency of biting insects, had nothing but analogy to go on. The suggestion of using boots, &c., was, however, as a matter of fact, based on the idea that either fleas or bed bugs might very possibly be concerned in the matter, as it was felt that the circumstances of the case rather put our old friend the mosquito out of court, because were those insects capable of conveying the disease, few would be likely to escape.

A SPECIAL correspondent of the *Times of India* who has been visiting Poona to investigate the causes of the terrible exacerbation of plague in that city, draws a gruesome picture of the insanitary conditions subsisting in the poorer parts of the town. It is obvious that rat-killing operations can stand but little chance of success in such a honeycomb of dark, overcrowded cells as he pictures the homes of the people to be.

Personal Notes.

INDIAN MEDICAL SERVICES.

Arrivals Reported in London.—Lieutenant-Colonel E. W. Reilly, Captain T. G. N. Stokes, Major F. R. Ozzard, Major W. A. White, Major C. L. Williams, Captain F. H. G. Hutchinson.

Extensions of Leave.—Lieutenant-Colonel J. W. Poynder, 2 m. 21 d. leave, medical certificate; Major C. Duer, 3 m. furlough; Captain N. R. Rainer, study leave, May 1st to June 15th, 1906; Captain S. Anderson, study leave, April 11th to August 31st, 1906; Captain A. Miller, 6 m. furlough; Major S. A. Harris, 3 m. medical certificate; Captain S. Evans, M.B., 6 m. medical certificate; Captain H. R. Brown, 7 d.; Major T. W. Irvine, special leave commuted to furlough P.A. and extended 2 m. 8 d.; Major E. Wilkinson, study leave, May 1st to July 31st, 1906; Captain R. Brown, 14 d.; Captain R. M. Carter, 2 m. Captain J. H. Hugo, furlough to March 6th, 1907; Captain N. R. J. Ranier, study leave, June 16th to October 1st, 1906: Major W. H. W. Elliot, D.S.O., 27 days.

Permitted to Return to Duty.—Major J. Morwood, Major T. W. Irvine, Captain R. M. Dalziel, Major A. Street, Colonel H. Hamilton, C.B., M.D., Lieutenant-Colonel C. J. Starkies, Lieutenant-Colonel M. A. T. Collie, Captain L. J. M. Deas, Captain F. D. Browne, Lieutenant-Colonel R. H. Cama, Captain D. G. R. S. Baker, Captain A. E. J. Lister, Major P. J. Lumsden, Lieutenant-Colonel J. S. Daly, Major W. H. W. Elliot.

Trooping.—The following officers of the R.A.M.C., embarked on the *Rewa* for India on the 19th ult.: Colonel P. M. Ellis, Lieutenant-Colonel R. L. R. Macleod, Lieutenant-Colonel D. M. O'Callaghan, Captain A. W. Hooper.

Postings.

On transfer from Ferozepore, Major E. V. Hugo, I.M.S., is appointed to officiate as Civil Surgeon of Lahore, Professor of Midwifery and Forensic Medicine, Lahore Medical College, and Medical Officer in charge of the Medical College, Lahore, relieving Lieutenant-Colonel H. Hendley, I.M.S., proceeding on leave.

Captain Paton, services replaced under Sanitary Commissioner with Government of India.

Captain W. M. Pearson officiates as Deputy Sanitary Commissioner, 2nd Circle, United Provinces.

Captain W. H. Cazaly acts as Deputy Sanitary Commissioner, Southern Registration District, Bombay.

Captain H. Crosbie to additional charge of current duties as H.M. Consul, Kermanshah.

Major A. L. Duke, to additional charge of current duties as Political Agent, Bikanir.

Major R. J. Macnamara, services placed at disposal Sail Department, Government of Madras.

Colonel J. McCloghry is transferred as P.M.O. from Quetta, to Abbotabad.

Colonel H. K. McKao, C.I.E., from the Presidency and Assam Brigades to the Meerut Division.

Hon. Lieutenant L. J. O'Reilly, I.S.M.D., to be Civil Surgeon, Etah.

Major W. Vost is transferred from Gorakpur to Muttra, as Civil Surgeon.

Major D. M. Moir, Professor Medical College, Calcutta, is appointed to the Managing Committee of the Zoological Gardens, Calcutta.

Captain W. O'S. Murphy to the charge of the Observation Camp for Pilgrims, Perim, Dr. J. H. Walsh, Uncovenanted Medical Service, acting in his place as Special Health Officer, Kurachi.

On return from leave, Surgeon-General W. R. Brown, I.M.S., will become Surgeon-General with the Government of Madras, and Colonel P. Benson, I.M.S., who has been officiating, will go as Principal Medical Officer to the 6th (Poona) Division.

Captain D. Munro, to the Medical Charge, 11th Lancers.

Major F. R. Ozzard, to the Medical Charge, 7th Rajputs.

Captain A. Lister, to the Medical Charge, 19th Punjabis.

Captain N. W. Macworth, to the Medical Charge, 41st Dogras.

Captain R. M. Barron, to the 54th Sikhs.

Captain R. F. Bird is placed on Plague duty.

On return from leave Major S. K. Close becomes Civil Surgeon of Shahjahanpur, relieving Major J. G. Humbert, who goes to Farrukhabad.

Hon. Captain E. P. Clements, I.S.M.D., to be Civil Surgeon, Hardoi.

Captain E. L. Perry, officiates as Civil Surgeon, Dera Ghazi Khan.

Leave.

Colonel H. Barrow, R.A.M.C., for 6 m.
Lieutenant W. Brayne, 8 m. combined leave.
Captain D. N. Anderson, 6 m. combined leave.
Captain J. C. Kunhardt, 8 m. furlough.
Captain J. C. Robertson, 2 y. combined leave.
Captain F. H. Hutchinson, 1 y. 7 m. combined leave.
Captain F. Wall, 6 m., medical certificate.

Retirements.

The following Senior Assistant Surgeons, Bengal, are permitted to retire: Honorary Captains Brown, Bailey, and Hogan.

Lieutenant R. Cobb is permitted to retire.

Captain L. Gundall is transferred to the temporary half-pay list.

Promotions.

Captains to be Majors, July 28th, 1906.—Thomas Arthur Granger, M.B., Harold John Kinnahan Bamfield, John Wemyss Grant, M.B., Arthur Henry Moorhoad, M.B., William Davey Hayward, M.B., William Elmsley Scott-Moncrieff, M.D.

Lieutenants to be Captains, August 31st, 1906.—Robert Kelsall, M.B., John Hay Burgess, M.B., F.R.C.S., Charles Hildred Brodribb, M.B., John McCallum Anderson Macmillan, M.B., Clifford Allchin Gill, William Edward James Tuohy, Terence Francis Owens, Richard Francis Steel, M.B., George Francis Innes Harkness, Arthur Charles Ingram, M.D., Gordon William Maconachie, M.B., Ernest William Charles Bradfield, M.B., Alexander William Montgomery Harvey, M.B., Charles Isherwood Brierley, John Brown Dalziel Hunter, M.B., Edward Temple Harris.

Robert Joseph Macnamara, M.D., Herbert Wilson Pilgrim, M.B., F.R.C.S., Francis Wyville-Thomson, M.B., Edwin Harold Brown, M.D., F.R.C.S.E., Charles Norman Bensley, Selby Herriot Henderson, M.B., Blenman Buhos Grayfoot, M.D., David Wilson Scotland, M.B., Charles Robert Mortimer Green, F.R.C.S., Richard Henderson Castor, Thomas Edward Dyson, M.B., Edward Christian, Hare Frank Cecil Clarkson, John Gregory Jordan, M.B., Herbert Mackinlay Morris, Allan Rupert Postance Russell, James Morwood, M.D., Frederick George Maidment, Edmund Alexander William Hall, M.B.—September 30th, 1906.

R.A.M.C.

On arrival from England, Colonel P. M. Ellis becomes P.M.O. Quetta Division and Colonel J. G. Harwood, P.M.O., Presidency and Assam Brigades.

Colonial Medical Service.

Cyril E. Thwaites, L.R.C.P., M.R.C.S., has been appointed Civil Assistant Resident in Northern Nigeria.

Dr. F. G. Hopkins, Senior Medical Officer of Southern Nigeria, is acting as Principal Medical Officer during the absence on leave of Dr. H. Strachan, C.M.G.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the Journal of Tropical Medicine *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Lancet," September 29, 1906.

(I.) Two Cases of Hepatic Abscess Treated by the Transpleural Operation.

Taylor, H., describes two cases of tropical abscess of the liver, treated by incision, removal of part of a rib, opening the pleural cavity, cutting the diaphragm, and on reaching the liver stitching the liver to the adjacent parts. In one patient, as usual, "very shallow, and interrupted respiration supervened on the admission of air to the pleural sac and patient became very cyanotic." In the same patient, "while the wound was being gently syringed out with 1 in 40 carbolic lotion, the patient suddenly complained of great pain in the epigastrium, became pallid, broke out into a profuse perspiration and vomited." Syringing liver abscesses has been frequently condemned, and Dr. Taylor's case adds another warning against the procedure. Dr. Taylor advocates the transpleural operation and condemns the use of the trocar and cannula, indulging, as usual, in wholesale abuse of the method, stating that: "I venture to think that such stabs in the dark, or at least into an obscurity, are out of place," &c., &c. It will be seen that over-heroic operations for hepatic abscess by transthoracic and transperitoneal methods are still in vogue.

(II.) Endemic Hæmaturia.

Stock, Capt. Philip G. This is an account, from the epidemological point of view, of an outbreak of bilharzosis among the men of the 8th Hussars, at Pretoria, in 1902, in which forty-three men were attacked. The author tried to repeat Sonsino's observations as to the existence of an intermediate host, in the shape of some species of mollusc, in which the parasite passes through a *redia* stage, but failed to obtain any confirmation of this view. He accordingly strongly favours the idea that the embryos pass directly to the human host, by the agency of water, either by drinking or by bathing, and argues that the former is the more probable mechanism of infection, as some cases had occurred who had not bathed, and that a certain amount of water always enters the mouth or nostrils when bathing.

He shows that the "period of incubation," *i.e.*, the interval between infection and the appearance of symptoms, varies from one to two months, the movements of the troops giving an excellent opportunity of forming an opinion on this point. As to treatment, he makes the interesting suggestion of the administration of a toxin in the form of Wright's serum, basing his proposal on the disappearance of symptoms in two cases which contracted typhoid and in another of dysentery.

(III.) A Case of Ainhum.

Alexander, D. M., and Donaldson, R., describe a typical case of ainhum. Patient, 44, born in Port Antonio, Jamaica, went to sea at 14. Developed hypertrophy of little right toe and a subsequent narrowing behind. The part was amputated through the narrow neck, which proved to be of fibrous tissue and did not bleed when cut. The cause was not determined.

(IV.) The Study of a Case of Plague.

Cleland, Burton J., states that the lengthy incubation noted in plague is due to the fact that living plague bacilli probably liberate few, or no, toxic bodies; it is only when owing to overcrowding of a gland bringing about loss of food supply, or as the result of anti-microbic bodies when the bacilli die, that their endocellular toxins are liberated and local and systemic reaction follow in proportion to the dose. In other words, the presence of living plague germ infection belongs to the period usually named the incubation period, and because the living bacilli are not toxic, and it takes some days before the bacilli are killed and their toxins are set free. Dr. Cleland sums up the argument when he states: "The onset of signs and symptoms in plague is the first indication of commencing recovery from the disease." This statement bears out that which was enunciated by Drs. Hunter and Simpson from observations made in Hong Kong. The development of the bubo is a late phenomenon of plague; gastro-intestinal symptoms (Hunter and Simpson) precede its appearance, and, in fact, all evidences of fever. In Dr. Cleland's case also, diarrhœa was one of the first signs of infection and preceded all others by three days. This theory, which is now being widely received, explains why there is so seldom any local reaction and as rarely a lymphangitis in plague, compared with other infections, say, by streptococci, and why one set of glands are, as a rule, infected, and supports also the skin inoculation theory of plague.

"Bulletin de l'Institut Pasteur," T. iv., Nos. 17 and 18.

Anti-Cholera Inoculations in India.

Haffkine, Prof., gives an interesting *résumé* of his work on this subject extending over many years, and comes to the conclusion that although the case incidence among the vaccinated is only about a tenth of that obtaining among

the unvaccinated, the mortality among those actually attacked differs but little.

The protective effect of the vaccine commences at once and increases rapidly for the first four days after the operation, and lasts about fourteen months: after which its effects diminish rapidly and probably disappear completely.

These facts are of great interest in forecasting the chances of success of anti-typhoid inoculation, but can hardly be said to retain much interest in connection with the practical question of combating cholera, as Prof. Hankin's, of Agra, discovery of the use of permanganate of potassium for the disinfection of wells, has made cholera an easily controllable disease wherever the suspicious prejudices of the Indian native do not prevent the proper carrying out of the measure; and wherever this is the case it may be taken as certain that anti-choleraic injections will be even more stoutly resisted.

It must be remembered that these vaccinations are no light matter, and so much is this the case that in one instance in the abstracter's experience, the men of the Shropshire regiment who had had personal experience of the operation; through writhing in the agonies of cholera in a terrible outbreak at Sitapur, absolutely refused to submit to ordinary anodine hypodermic injections, because they suspected that the medical officers intended to repeat the anti-choleraic vaccinations that had been conducted in the regiment a few months previously.

"Bull. Chambre d'Agriculture de Cochin Chine," 1906, p. 39.

DISTRIBUTION AND SYMPTOMOLOGY OF SURRA IN COCHIN CHINA.

Brau, St. Sernin, and Mutin Boudet confirm the existence of surra in Saigon, already suspected by Blin and Chaptal, but regard the occurrence as merely sporadic in mules and horses from Annam and Cape St. Jacques. They distinguish two forms—the "dry" and the œdematous—of the disease, and found that the presence of the parasites in the blood was intermittent. Inoculated dogs died in about fourteen days, after a three days' incubation. They tried treatment with mercuric methylarseniate dissolved in K. I. with encouraging results.

"Centralbl. f. Bakter.," I., Origin., T. xl., p. 683.

THE NEW ROUTE OF CUTANEOUS PENETRATION OF LARVAL ANKYLOSTOMES.

Schüffner, W.—Regarding infection by penetration of the skin as definitely established, the author attempts to define the importance of this route of infection as compared with that through the intestinal canal.

Schüffner is working in Sumatra, where ankylostomiasis is extremely common, but he nevertheless found considerable difficulties in obtaining cultures of the larvæ, and believes that this is due to the presence in the excrements of other rival organisms which may crowd out the young Ankylostomes. In his particular case the hostile and victorious organisms were *Strongylus stercoralis* and the larvæ of a fly, besides which he found it necessary to check the development of infusoria by the addition of 2 to 3 drops of a 10 per cent. solution of quinine. He specially studied the onset of cutaneous infection and finds that a few drops of a rich culture placed on the arm, produces, in half an hour, intense itching, and the subsequent formation of a pustule, but his sections of skin so infected, though they clearly demonstrated the fact of penetration, failed to confirm Loos' observations as to the hair follicles being selected by the larvæ as a point of entry. The neighbouring tissues were markedly infiltrated with eosinophyl leucocytes.

He notes that the larvæ disperse very rapidly in water, and hence concludes that infection must usually be by isolated individuals, under which circumstances the local irritation is far less than that of a mosquito bite, and no pustule forms, so that the occurrence would usually pass unnoticed. He further discusses the various cutaneous lesions that have been described, and in particular "ground itch," and comes to the conclusion that none of them bear any relation to the penetration of the ankylostomes.

In making these observations, Schüffner overlooks the undoubted fact that infection by the agency of water is probably a very rare occurrence, as the larvæ require fæcal matter for their nutrition, and die out very quickly in water unless it be grossly foul with excrement to such an extent that the most callous of indigenous races would neither drink of nor bathe in it. Note also Loos' observation of their habit of crawling out of water. The much fouled soil, however, in the neighbourhood of native villages usually teems with the larvæ, which must thus be constantly brought in contact with the naked feet and ankles of the inhabitants, while his negative results in the search for larvæ in these skin lesions can count for nothing as opposed to the positive results of previous investigators. No one pretends that larvæ can constantly be found in all stages of what is known as "ground itch," as the irritation and pustulation are maintained by the agency of scratching and of ordinary pyogenic organisms long after the larvæ have passed through the skin; which indeed must, in all probability, be rendered unfit to serve as a site for further penetration by the inflammatory changes set up. His explanation, however, of the capriciousness of the results of breeding experiments through the action of rival organisms is, however, of great importance, and to those who have worked practically at this question, accounts for much that has hitherto been puzzling.

"Scient. Memoirs of the Med. and San. Departs. of Govt. of India."

PARASITE OF THE WHITE BLOOD CORPUSCLES OF PALM SQUIRRELS.

Patton, Capt. W. S., I.M.S.—In Kathiawar, some 98 per cent. of this squirrel (*Funambulus pennantii*) were found to be infested by a parasite of the mononuclear leucocytes, as many as half the corpuscles being infected. The parasite is of vermicular form, 13 to 15 microns long, by 3 to 4 microns wide, with pointed ends, and has been named by the author *Leucocytozoon funambuli*.

They are typical hæmogregarines, stain well with Romanovsky, and possess a voluminous nucleus (sometimes double), which is central in position, besides which there are a number of cytoplasmic granules.

Comparing infected animals with healthy squirrels from Madras, the former were found to present a marked excess of mononuclears, a point which the author believes may have a bearing on the etiology of leucocythæmia. The parasites are very numerous in the spleen and may be readily found in the liver and kidneys, but none of the organs showed any developmental forms. The only external parasite harboured by the squirrels was a louse, which proved to be a new species of the genus *Hæmatopinus*, but no evidence could be found of the louse acting as an intermediate host.

"Schrift, der Physch.-okonom. Gesells.," z. Konigsberg, T. lvii., p. 97.

THE PENETRATION OF THE SKIN BY NEMATODE LARVÆ.

Lühe, M.—The researches of Loos on this subject appears to the author to afford an explanation of a point noted by him in 1896, in the examination of the body of a panther. The pulmonary alveola contained enormous numbers of nematode larvæ, very uniformly distributed through the organ, but without producing any obvious lesions. The other organs were free from any similar parasites except the intestine, and between the villi of the latter were young examples of *Uncinaria perniciosa* which had

caused small extravasations of blood. He now regards these facts as but another example of the migration of nematodes in the manner discovered by Loos.

"Zeitschr. fur klin. Med.," T. lviii., p. 43.

ANKYLOSTOME INFECTION *viâ.* THE SKIN.

Loos, Dr. A. Returning to the consideration of this subject, the author discusses replies to the objections that have been raised against his theory of infection and the practical considerations that result therefrom.

He first recapitulates the steps that led to his discovery—his accidental infection of himself under circumstances which rendered invasion *per os* highly improbable; the experiment on the leg of a patient an hour before amputation, and those he afterwards made on young dogs with *Ankylostoum caninum* and *duodenale*, and recalls his conclusion that the route followed by the larvæ is the venous or lymphatic system, the right heart, the lungs, trachea, œsophagus, &c. While passing through the lymphatic glands, particularly those of the axilla, large numbers of the larvæ are destroyed by phagocytes, and the stages of the process are followed out.

The symptoms produced depend largely on the number of larvæ that gain admission simultaneously. When this is serious they consist of diarrhœa, more or less general œdema, and multiple hemorrhages which he attributes, not to mechanical but to toxic action. The age of the subject greatly influences the results as the skin in the young is much more easily penetrated, and the resulting infection proportionally more serious.

Arrived in the intestine, Loos believes that the worms feed not on blood, but on the mucosa, and considers the hæmorrhage that results as accidental.

It may, however, be pointed out that in expressing this opinion Loos runs counter to the undoubted fact that the greater proportion of parasites found *post-mortem* in the intestines are swelled out like leeches, and that the contents of their intestines undoubtedly consist of blood. Moreover, when examined still living *in situ*, in a *post-mortem* conducted sufficiently early after death, the ankylostome will be found so firmly fixed to the mucous membrane that it is difficult to understand how any food other than the blood from the bite can gain access to the buccal cavity of the worm; and it may be further noted that Loeb and Smith described certain organs producing a powerfully anti-coagulant substance which would be quite useless, assuming Loos' very surprising theory on this point to be correct.

Loos does not deny infection *per os* as an occasional mode of access for the parasite, but believes that it is of very minor importance as compared with penetration of the skin, and, further, is of opinion that when the former takes place, drinking water is seldom if ever the vehicle, but that raw vegetables are more frequently concerned, though the commonest method of infection by this route is through eating with hands soiled with earth, especially in the case of miners.

He states that the larvæ die very rapidly if dried, so that unless they penetrate the skin very shortly after deposition on it, they necessarily perish; but this sensitiveness to desiccation is quite contrary to the abstractor's personal experience, and though the latter is aware that Loos explains this by the presence of other species of nematode larvæ in the cultivations used, he does not find the explanation adequate, and believes that under certain circumstances the larvæ show remarkable powers of resisting dryness, short of absolute desiccation.

A very important observation made by Loos is that larvæ that find themselves in water, crawl out of it by climbing the moist banks of the pool, and that they are thus found at all heights—on the sides of mine shafts and drivings, so that they are continually coming in contact with the hands of the miners as they feel their way along the ill-lighted passages. This migration can not, however, as Tenholt supposes, be made in search of food, as at this period of its existence the larvæ is enclosed in a capsule formed by the integuments of its last ecdysis.

The larvæ develop best at a temperature of 28° to 30° C. and still develop slowly at 15°, but the danger to miners from the disease is nevertheless always proportional to the warmth of the mine. With regard to prophylaxis, Loos, like every other practical observer who has studied the subject, comes to the conclusion that no measures other than those of an efficient conservancy can be expected to be of any real use.

"Anne. de l'Inst. Pasteur," May, 1906.

Nicolle finds that some monkeys, particularly *Macacus siniens*, show a certain amount of susceptibility to leprous inoculation, the subcutaneous method of inoculation is the only one productive of results, and the best results are obtained after successive inoculations. Inoculation according to experimental research varies from twenty-two to ninety-four days; the lesions produced are transitory, although many leprous bacilli have been shown by Nicolle within the large mononuclear leucocytes.

"British Medical Journal," October 20, 1906.

I.—NOTE ON A FILARIAL LARVÆ IN THE BLOOD OF A BLACKBIRD.

Symmers, Wm. St. Clair, found in a dead blackbird (*Terdus merula*), in his garden at Belfast, Ireland, filaria embryos in active movement in the heart blood. The larvæ resembled closely *Filaria perstans*, being without a sheath and having both extremities blunt. In size it is smaller than *perstans* and is apparently identical with the larva described by Manson in "Natives of British Guiana." The parent worm was not found in the blackbird. Avian filariasis is well known in several parts of the Tropics, but the discovery of the embryo in the British Isles, by Symmers, is of great interest, especially in regard to the geographical distribution of this parasite.

II.—MEMORANDUM ON THE OBSERVATION OF SPIROCHÆTES IN YAWS AND GRANULOMA PUDENDI.

MacLennan, Alex., in smear preparations from yaws sent from St. Vincent, West Indies, by Dr. Branch, found spirochætes similar to those of *Spirochæte pallida*. In one preparation taken from a papilloma in recurrent yaws, numerous spirochætes were observed.

In two smear preparations from *Granuloma pudendi* sent by Dr. Branch, Dr. Mackennan found spirochætes, probably *refringens*. In one smear the parasites were found much longer than the *Spirochæte pallida*, and the waving finer and closer; as many as forty waves being counted in one specimen.

III.—LARVÆ IN THE INTESTINE.

Drew, H. V., F.R.C.S., writing from Timaru, New Zealand, states that some two years ago he had as patients a mother and child suffering from a "nest of insects" similar to the condition described in the *British Medical Journal* of July 14, 1906. Mr. Drew states that the mother showed him "insects with rounded, hard, hairy backs, dark brown in colour, with black eyes, extremely repulsive looking, which ran about quickly." Santonin and purgatives brought away large numbers of these insects. Mr. Drew suggests they may be those of bot-flies, and enquires what is known concerning them.

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2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

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Original Communications.

MALARIA IN GREECE.

An address delivered to the Oxford Medical Society on November 29, 1906.

By Ronald Ross, F.R.S., C.B.
Professor of Tropical Medicine, University of Liverpool.

(Professor Osler, M.D., F.R.S., in the Chair.)

Professor Osler and Gentlemen, — I consider myself extremely fortunate in being able to introduce the subject of malaria in Greece to my countrymen, through such a very appropriate avenue as the Oxford Medical Society. I was actually considering how the introduction might best be effected when I received the invitation from your Secretary to address you to-night. For where could any one who wishes to discourse of Greece do so much better than in Oxford—herself the daughter of Greece, who has borne through the ages the torch first fired in that divine country? And, since my subject is Æsculapian, what audience could I find fitter than yourselves? But my luck does not end here; for in you, Mr. President, I have chanced upon the fittest of all presidents, eminent alike in science and in the humanities, to both of which my theme appeals. Further, when I first opened my beggar's wallet for subscriptions in aid of the cause which I have to advocate to-night, it was yourself who contributed the first dole—a goodly number of solid drachmæ, in aid of Greece. The omens are therefore propitious, and if I fail it will be the fault of myself rather than of fortune.

First let the Muse explain (she is sorry that she cannot do it in hexameters) how it came that so humble an advocate as myself was selected for so great a client. Early in the year I was asked by a British Company, which owns certain large tracts of land in Greece, to go there in order to advise as to the best means of reducing the malaria which for a long time had been persecuting the Company's employees. I arrived in Greece towards the end of last May, and there, sure enough, found Andromeda in tears, awaiting the onslaught of the fell monster which was just then preparing to arise (metaphorically speaking) from his long winter sleep in order to devour her. After inspecting the latter, instead of slaying him outright, I determined, more wisely than heroically, to retire for assistance, and I am here to-night in furtherance of that intention.

Now let me begin by describing exactly my own experiences in Greece. As everyone knows, the country consists principally of a mass of mountains with small valleys between them, here and there, and many straits and inlets of the sea. In fact, the configuration is very like that of the Highlands of Scotland. The scenery does not possess the great variety of colour caused by the light and shade of the humid atmosphere of the Highlands; it is brightly but uniformly coloured. On the other hand, its comparative aridity is compensated for by a singular beauty and variety of contour, which are not excelled in the Alps or even in the Himalayas. High enough to retain for most of the months of the year an exquisite lacing of snow, the mountains, though barren and stony, make a long vista of outlines against the very lovely sky. I have never seen a sky equal to that of Greece. In the Tropics a yellow light is reflected from the burning ground upon the lower strata of the air, and only the zenith is blue; but in Greece the azure extends almost down to the horizon, except for a narrow margin of brilliant silvery or pearly light. After sunset the sky seemed to me to possess, not the deep night blue of the Tropics, but a wonderful purple tint of its own, in which the "new-bathed stars" shine with a brilliance not exceeded even in the desert. At midday, the almost tropical glare of the sun on the chalky soil is relieved by the dark shades of the plane trees and the classical cypresses, and the bright green of the vines. It has been my fortune to see many beautiful countries, but I think that Greece and Britain hold the palm.

The particular valley which I was called upon to visit was that of Lake Kopais, in Bœotia. After leaving Athens, the comfortable train winds along between Mount Pentelikon on the south and Mount Parnes on the north. Then, passing across the eastern spurs of Parnes, in full sight of the Island of Euboia and its strait on the right, it enters the valley of Thebes. Traversing this it goes through the defile of the Sphingion (where the Sphinx used to waylay travellers with her riddles) and emerges on the Kopaik Plain. This is a large area about six miles broad and twelve miles long, the long axis pointing west and east. On the east the plain is bounded by the Mountain of the Sphinx, which seems, from certain points of view, to have the shape of a woman's figure reclined along its crest. Along the whole of the south side runs the beautiful range of Helikon, the Mountain of the Muses. The birthplace of Hesiod is in one of its valleys; and near one of the summits there is the famous fountain of Hippokrene, where the winged horse, Pegasus, took flight for heaven, owing, it is said, to some annoyance from the literary critics of the day. At the western extremity of the plain rises the magnificent mass of Mount Parnassus, the Mountain of Apollo, with its summits clad in dazzling snow. But to resume. The Kopaik Plain itself is almost absolutely flat right up to the feet of the hills which bound it, being, indeed, the dried bed of a lake. In ancient days, according to the interesting writings of Dr. J. G. Frazer, of Cambridge, this lake was a large sheet of water in the winter, and, in the summer, a series of marshes overgrown with sedge, with rivers winding through them and patches of dry land between. The lake was drained in very remote times by the people of Orchomenos, a town upon its banks, and the remains of the drainage works are still visible. The water enters from numbers of small rivers and streams gushing out of the surrounding mountains, and naturally escapes, singularly enough, into great caverns, of which there are many, called *katavothræ*. In the Middle Ages the drainage works appeared to have been allowed to fall out of repair; but recently a French company resumed the task; and, still more

recently, the work was taken up by the British Company, the Lake Kopais Company, which asked me to study the malaria for them. The whole bed of the ancient lake is now a great plain covered with crops of all kinds, which repay the cost of the engineering works. The water is at present discharged through adjacent valleys into the sea.

It was here that the malaria was so troublesome. The Lake Kopais Company has many hundreds of employees and tenants, who were constantly being attacked, although most of them were natives of Greece. It had not been found possible to keep accurate statistics of the annual number of cases; so that my first care was to make an estimate for myself of the amount of malaria present. This can be done with a fair degree of accuracy, without the help of statistics, in two ways—by ascertaining the proportion of people which, first, have the parasites of malaria in their blood, and, secondly, possess enlarged spleens. The first method was much used in India by Stephens and Christophers, who called the ratio of infected persons to the total population the *endemic index*. To obtain an absolutely correct figure by this means we must make an exhaustive microscopical examination of the blood of every person in the area under consideration; but this would be too laborious for practical purposes; and we must consequently content ourselves with an approximate valuation obtained by examining only a part of the local population. As shown by these observers, and by Professor Koch, it is especially the native children in a malarious locality who have the parasites in detectable numbers—the older people becoming comparatively immune. The blood of a number of unselected children is therefore carefully searched for the parasites, and the ratio so obtained is recorded as the approximate endemic index. For exact work a large number of children must be examined, as otherwise the margin of error, as shown by Poisson's formula, will be very considerable. For example, if 50 children be examined, and 25 of them be found to contain parasites, the error will be no less than 20 per cent.; so that the approximate endemic index will not be 50 per cent., as a hasty observer may think, but anything between 30 per cent. and 70 per cent. This fact is worth recalling, because it has been much overlooked in recent work on the subject, and because it shows how laborious the method really is. The second method, that of examining children for enlargement of the spleen, a thing which can be done in a minute, is much easier, and fairly trustworthy, provided that no other cause for splenomegaly is present.

With the valuable assistance of Dr. Kardamatis, General Secretary of the Grecian Anti-malaria Society, and of Mr. D. Steele, Manager of the Lake Kopais Company, in Greece, I was able to use both methods. The Company's houses are on the southern border of the plain, close to the site of the ancient Haliartos, where the Spartan Lysander was defeated by the Thebans, 395 B.C., and to the reputed grave of Alkmene, the mother of Hercules. The houses are built just where the slopes of Helikon begin to rise from the plain; so that they were obviously not too highly situated to be affected by the malaria. On examining 57 of the employees, most of whom were Greeks, we found enlargement of the spleen in 14 and the parasites in 9. But 5 of those that had parasites had no enlargement of the spleen, and must be added to the infected list, which therefore amounts to 19 out of the 57, or one-third. The majority of these people were adults; and many had come from other localities, so that the figures are not useful for statistics.

Our next care was to examine the people in some of the neighbouring villages. Out on the plain, about a mile or more from the Company's houses, there is the village of Moulki, containing some 350 inhabitants. The houses are closely clustered together, with very irregular and elementary lanes between them. Going to the village inn close to the school, we set to work and examined 80 persons, mostly children; first, by palpating them for enlargement of the spleen, and secondly, by making dried films of their blood for future microscopical enquiry. The scene was most interesting. Seated under a large tree, with the village priest as our patron and protector, we pricked and palpated the little ones, one by one. I never saw pluckier children. Scarcely one of them even winced at the vivisection. Nearly all of them were very intelligent, and many good looking; but, alas! most of them were far from well, and some looked miserably ill, emaciated and anæmic. The cause was speedily revealed. Out of 62 of the children, between the ages of 5 months and 14 years, no less than 35 were found to have enlarged spleens; and as no other cause of endemic splenomegaly, such as kala-azar, could be ascertained to be present in the locality, we could attribute the enlargement in these children only to malaria. This diagnosis has been fully confirmed by subsequent examinations of the blood films, which showed that the parasites existed in at least 17 of the 62 children at the time when the films were made. Of these 5 had an appreciable enlargement of the spleen, so that this number must be added to the number of spleen cases in order to arrive at the total yielding evidences of infection. Hence, out of the total 62 children, no less than 40 were certainly infected—a ratio of them of 64·5 per cent. This is, of course, the lower limit of the ratio, because it is quite possible, and indeed very likely, that the parasites were overlooked in some of the films. Such a ratio was unexpectedly high for any European country, and is almost equal to any that has been found in Indian or African children.

I may add that in many of the children the splenic tumour was very great, reaching almost to the crest of the ilium. This is important, in view of statements recently made in India to the effect that great splenic tumour is probably due to kala-azar, rather than to malaria. The former disease is apparently not present in Greece, the *Leishmania donovani* parasite never having been discovered there. Moreover, the Grecian cases were markedly different from the cases of kala-azar studied by me in Assam, in 1898, for the purposes of an official report. In not a single one of the former did we note any enlargement of the liver, so commonly seen in kala-azar; there was not the constant fever of kala-azar, the expression of the face was the unconcerned expression of malaria rather than the hopeless look of the deadly eastern disease; and lastly, the death-rate was far too small for the latter. Nevertheless, the splenic enlargement in a few of these cases of

pure malaria was, I think, as great as anything I saw in kala-azar. Of course, many of the children were shockingly anæmic and emaciated—not in any way, I was informed, from lack of food, nor, apparently, from the great prevalence of other diseases. The work was clearly that of the spirit of the marsh.

The next thing to do was to find the source of the malaria, or rather its carrying agents, the local Anophelines. As I have said, the Kopaik Plain is now drained and cultivated over its whole extent; but numerous small streams enter it from the surrounding hills, traverse it, and discharge into the main channels of drainage. These streams are swollen torrents in the winter, but in the summer often become trickles of water with occasional marshy borders here and there. Several such streams enter the basin near Moulki; but at that season (May to June) we could find no Anopheline larvæ in them, though some have been found subsequently, as we conjectured would happen with the advance of the dry season. But in addition to these streamlets there exists a long series of shallow pools suitable for the larvæ in the "borrow-pits" made by the engineers who constructed the railway embankment across the plain. Sure enough, in some of these pits close to Moulki we found the peccant insects, the larvæ of *Myzomyia maculipennis*, a known carrier of malaria. These gnats, rising from the pools, pour into the village and into neighbouring houses, such as those of the Company; become infected by biting the numerous infected children; and then infect any healthy persons whom they may subsequently bite. The old drama, now so well known, was obviously being played out before our eyes.

After having dealt with Moulki we examined the conditions at another village of about 575 inhabitants, situated several hundred feet high on the hills south of the Company's houses, and called Mazi. Out of 40 school children, we found enlargement of the spleen in 13, and the parasites of malaria in 16. Of those that showed the parasite, 7 had no enlarged spleen; so that we must add them to our total of infected children, giving 20 infected out of a total of 40 examined, that is, one-half. This is a large proportion, and we expected to find some breeding pools of Anophelines close at hand. In this, however, we failed; though we saw some lime pits which we thought might become suitable for the larvæ at a later season. But, nevertheless, there was no difficulty in explaining the malaria at Mazi, since we learnt that every year nearly the whole population descends to the plain for the harvesting in the month of August (the most malarious month) and bivouacs there for days or weeks. Doubtless the people of Mazi become infected on these occasions; though I suspect that breeding pools will be found close to the village by more extensive search.

My time being very limited, we could make only hasty studies at other spots. Across the Plain lies the village of Skripou, on the site of the ancient Orchomenos. Here we found splenic enlargement in exactly half of 40 school children examined; but had no time to take blood films. The village is evidently intensely malarious. We had time to look for mosquito larvæ only in one spot, the beautiful Fountain of the Graces, which gushes out of the mountain and spreads in a small marsh near at hand. Here, again, we found the shameless insects desecrating the divine spot. What must have happened when the Graces bathed there I cannot say. We saw only washerwomen and geese.

Thus on the borders of the Kopaik Plain we had examined 142 children and had found certain evidence of malaria in no less than 80, or 57 per cent., a very high malaria rate. But we soon obtained evidence that the disease is not confined to this low-lying area. Livadhia is a beautiful little town of 6,250 inhabitants, situated 540 feet up the spurs of Helikon, some miles beyond the western end of the Plain and facing Mount Parnassus. It begins at the romantic gorge where was the Oracle of Trophonios in former days, and where the two springs of Lethe and Mnemosyne—Forgetfulness and Memory—now flow out of the rock. Notwithstanding the height of the situation and the absence of any apparent marshes close at hand, we found enlargement of spleen in 16 out of 100 school children here. The infection is probably obtained in lower areas outside the town; but we had no time to make any search for the Anophelines. We spent some hours also at Thebes itself. This famous place, which used to contain 40,000 inhabitants now contains only 4,780. Situated on a rocky eminence in the midst of a large plain, the historic Kadmeia, it is considered to be very fairly healthy; and indeed we found enlargement of the spleen in only one child out of 50 examined; and failed in obtaining any larvæ of Anophelines in several small pools round the base of the renowned citadel. Such researches carried out on the spot where lived Pindar and Epaminondas, where Theban, Athenian, and Spartan had frequently mingled in battle, and where angry Alexander wreaked his vengeance, were "of the age." I am not certain whether the little wriggler of the puddles had not been a worse enemy to Thebes than was the great conqueror. One remains, the other has passed away for ages. If Diogenes had possessed our present knowledge he might have made a still more caustic reply to his powerful visitor.

Thus, altogether, out of 292 unselected children examined by us in five different places, we found unmistakable evidence of malaria in 97, or one-third. In addition to the children we examined 18 adults at Moulki. As is now well known, the adult natives of a malarious locality become comparatively immune, their spleens returning to the normal size, and the parasites becoming extremely scarce in their blood. Nevertheless, we found signs of malaria in 4 of these adults, but, of course, such figures are not useful for estimating the endemic index. Including all, we found certain evidence of malaria in 120 out of 367 persons, or 32 per cent. The figures for the children, however, give a reliable and high malaria rate, especially when it is remembered that they were collected at the beginning of the summer, *before the annual malaria season had commenced*. Later in the year the endemic index would certainly have been still higher. If, moreover, we had examined the blood of the 200 children dealt with at Orchomenos, Livadhia, and Thebes, we should certainly have been able to add many other cases of infection to our list; while lastly,

we should remember that in all cases of malaria the parasites frequently become temporarily too few for detection by the microscope. Our total estimate of 33·2 per cent. infected children must therefore be much below the maximum ratio, and may be looked upon as a minimum ratio. The statistical corrections by Poisson's formula works out at 7·7 per cent.; so that we have finally for the five localities, Moulki, Mazi, Orchomenos, Livadhia, and Thebes, a minimum child-malaria rate of between 25·5 per cent. and 40·9 per cent. The truth is, probably that at Moulki and Orchomenos *all* the children are really infected in the autumn.

With regard to the number of breeding places of Anophelines we found them only in two small pools, one at Moulki and one at Orchomenos; and the former of these was immediately drained away by Mr. Steele, of the Lake Kopais Company. The season, however, was early, and our search far from exhaustive. Many more pools will, of course, be found; but, nevertheless, I infer that the amount of breeding surface per square mile of country is extremely small, so that anti-propagation measures ought to be correspondingly cheap.

Such were the results of my own observations; and I will now give briefly some figures which I obtained for the whole of Greece. Within the last year or two there has been founded at Athens an admirable Malaria Society for the study of such questions. It is under the patronage of H.M. the King of Greece, and consists of many enthusiastic members. One of these is my friend, Dr. Savas, Professor of Hygiene at the University of Athens, and Physician to the King of Greece; and the General Secretary is my friend Dr. Kardamatis, who gave me so much assistance at Lake Kopais. I can testify to the complete knowledge of the subject possessed by both of these gentlemen—whom I mention more particularly than their colleagues, because I was brought more especially into contact with them; to their zeal in the cause, and to their philosophic grasp of the importance of the malaria question for their country. From them I obtained the following approximate figures for the whole of Greece:—

Population of Greece	2,433,806
Average annual number of cases of malaria	250,000
Average annual number of deaths from malaria	1,760
Number of cases of malaria during 1905	960,048
Number of deaths from malaria during 1905	5,916

These figures are, I think, as sound as any that can be collected from statistics. Malaria is a very difficult disease to deal with in this way; because it does not consist of a single severe attack demanding immediate medical assistance, but rather of a series of comparatively slight attacks extending over a period of years, and, moreover, occurring principally in young children. Many cases do not find their way into the returns at all; while, on the other hand, relapses must be frequently entered as fresh infections. As for the death-rate, comparatively few cases die simply of malaria, but many are carried off by intercurrent pneumonia or diarrhœa, or perish gradually from anæmia, under which headings the mortality is often recorded. The figures given above, however, agree entirely with my own estimate of the endemic index round Lake Kopais; and I believe that if similar methods could be used all over Greece—if all the children in the country could be examined—it would be found that an extremely large proportion of them are constantly infected. Last year was a very bad year, with a recorded death-rate of 2·4 per thousand of the population. Nor is the malaria of a benign type in Greece. On the contrary, I was informed by all the gentlemen mentioned above and also by a number of medical men whom I met at Thebes and Livadhia, that pernicious attacks are very common, and that the most serious form, that of blackwater fever, is extremely common. Such facts are recorded also in the writings of Kardamatis, Savas, and other able Greek observers. The disease is therefore extremely, if not shockingly, rife in the country—much more so even than in Italy. Dr. Savas told me that from some statistics which he had studied the number of cases and deaths in Greece are half again as numerous as in Italy for equal numbers of people. All species of the parasites are to be found in Greece. In our own studies the mild tertian parasite occurred most frequently, the so-called malignant species next commonly, and the quartan least of all—but not rarely. As I have said, blackwater fever, the worst form of malaria, has been very common in Greece. Regarding the species of Anophelines, which carry malaria in the country, Dr. Savas told me that out of 1,839 of these insects, 1,778 were found to be *Anopheles maculipennis*, 21 to be *Anopheles bifurcatus*, and 20 to be *Pyretophorus superpictus*, all well-known agents of the disease.

Now, what must be the effect of this ubiquitous and everlasting incubus of disease on the people of modern Greece? Remember that the malady is essentially one of infancy among the native population. Infecting the child one or two years after birth, it persecutes him until puberty with a long succession of febrile attacks, accompanied by much splenomegaly and anæmia. Imagine the effect it would produce upon our own children here in Britain. It is true that our children suffer from many complaints—scarlatina, measles, whooping-cough—but these are of brief duration and transient. But now add to these, in imagination, a malady which lasts for years, and may sometimes attack every child in a village. What would be the effect upon our population, especially our rural population—upon their numbers and upon the health and vigour of the survivors? It must be enormous in Greece. People often seem to think that such a plague strengthens a race by killing off the weaker individuals; but this view rests upon the unproven assumption that it is really the weaker children which cannot survive. On the contrary, experience seems to show that it is the stronger blood which suffers most—the fair, northern blood which Nature attempts constantly to pour into the southern lands. If this be true, the effect of malaria will be constantly to resist the invigorating influx which nature has provided; and there are many facts in the history of India, Italy, and Africa which could be brought forward in support of this hypothesis.

We now come face to face with that profoundly interesting subject, the political, economical, and historical significance of this great disease. We know that malaria must have existed in Greece ever since the time of Hippocrates, about 400 B.C. What effect has it had on the life of the country? In prehistoric times Greece was certainly peopled by successive waves of Aryan invaders from the north—probably a fair-haired people—who made it what it became, who conquered Persia and Egypt, and who created the sciences, arts, and philosophies which we are only developing further to-day. That race reached its climax of development at the time of Pericles. Those great and beautiful valleys were thickly peopled by a civilisation which in some ways has not since been excelled. Everywhere there were cities, temples, oracles, arts, philosophies, and a population vigorous and well trained in arms. Lake Kopais, now almost deserted, was surrounded by towns whose massive works remain to this day. Suddenly, however, a blight fell over all. Was it due to internecine conflict or to foreign conquest? Scarcely; for history shows that war burns and ravages, but does not annihilate. Thebes was thrice destroyed, but thrice rebuilt. Or was it due to some cause, entering furtively and gradually sapping away the energies of the race by attacking the rural population, by slaying the newborn infant, by seizing the rising generation, and especially by killing out the fair-haired descendant of the original settlers, leaving behind chiefly the more immunised and darker children of their captives, won by the sword from Asia and Africa?

Those who have read Dr. W. North's fascinating book on "Roman Fever" (Sampson Low, Marston and Co., 1896) will remember the suggestion that the depopulation of the Campagna was due to the sudden introduction of malaria by the mercenaries of Sylla and Marius, and so recently as 1866, as we know from the works of Dr. Davidson, of Edinburgh, malaria entered and devastated the islands of Mauritius and Reunion, either the mosquito or the parasite having been then brought in from without. Similarly, could it not have been introduced into Greece about the time of Hippocrates by the numerous Asiatic and African slaves taken by the conquerors? Supposing, as is probable, that the Anophelines were already present, all that was required to light the conflagration was the entry of infected persons. Once started, the disease would spread by internal intercourse from valley to valley, would smoulder here and blaze there, and would, I think, gradually eat out the high strain of the northern blood.

I cannot imagine Lake Kopais, in its present highly malarious condition, to have been thickly peopled by a vigorous race; nor, on looking at those wonderful figured tombstones at Athens, can I imagine that the healthy and powerful people represented upon them could have ever passed through the anæmic and splenomegalous infancy (to coin a word) caused by widespread malaria. Well, I venture only to suggest the hypothesis, and must leave it to scholars for confirmation or rejection. Of one thing I am confident, that causes such as malaria, dysentery, and intestinal entozoa must have modified history to a much greater extent than we conceive. Our historians and economists do not seem even to have considered the matter. It is true that they speak of epidemic diseases, but the endemic diseases are really those of the greatest importance.

The same cause works the same evil in modern Greece. Though the country has been freed from the Turks for seventy years, and enjoys what is condered to be (though personally I doubt it) the best form of government, yet its population has not increased very much. Athens has about 130,000 inhabitants, and Patras, the next largest city, about 40,000; and the other towns are scarcely more than large villages. The rural areas contain small and poor, but not destitute, hamlets; but what strikes one most in them is the absence of villas and of large hotels. Few of the wealthier people seem to live in the country. A gentleman of Athens told me that he bought a shooting-box, but that he was attacked by malaria when he went to stay there. The inns are comparatively small and shabby, and not likely to be frequented by many modern tourists, and the methods of communication are primitive. This is very surprising, because one would think that such a country would be the Mecca of all the tourists of Europe and America, who would pour their millions of pounds into it, just as they do into Switzerland. But, of course, the reputation of unhealthiness possessed by many of the rural tracts is fatal; the tourist thinks twice about going to them, and the innkeeper hesitates about spending his capital in a locality where he and his children may expect to be frequently ill.

The whole life of Greece must suffer from this weight, which crushes its rural energies. Where the children suffer so much, how can the country create that fresh blood which keeps a nation young? But for a hamlet here and there, those famous valleys are deserted. I saw from a spur of Helikon the sun setting upon Parnassus, Apollo sinking, as he was wont to do, towards his own fane at Delphi, and pouring a flood of light over the great Kopaik Plain. But it seemed that he was the only inhabitant of it. There was nothing there. "Who," said a rich Greek to me, "would think of going to live in such a place as that?" I doubt much whether it is the Turk who has done all this. I think it is very largely the malaria.

Now, regarding the remedy. Science has, of course, shown absolutely that the disease is carried by gnats, and, in doing so, has indicated several methods of prevention. First, there is the method of excluding gnats by the careful use of mosquito nets and wire gauze screens to the windows—useful for the houses of the rich, but too costly and troublesome for the poor. Then there is the method of Koch, the cinchonisation of all the patients, by which they themselves are benefited, while the gnats do not become infected and therefore do not spread the parasites; but this implies rigorous dosing with quinine for months—a thing which patients and the mothers of children will not submit to. But the method which I first suggested and elaborated in 1899, namely, the reduction of mosquitoes, is the one which I prefer, and the one which, after seeing the conditions in Greece, I prefer more than ever. It is, of course, the old Roman plan of drainage against malaria, with this important differ-

ence, that we are now no longer compelled to drain the whole surface of a malarious area, but only those small pools in which the Anophelines breed. This method has the immense advantage that it can be carried out by local authorities without troubling the people; while in the end it is sure to be more economical and lasting in its effects than other methods which, I think, are apt to cause waste both of money and effort. To Greece it is most especially applicable. There, the rainy season is the winter, when the mosquitoes do not breed; so that in the arid summer they can find only very few suitable breeding pools. So much the easier and cheaper will it be to treat these. They can be rendered uninhabitable for the larvæ by drainage, by filling up, by deepening, by dragging the weeds, and in the last resort by periodic oiling. Where carried out with intelligence and loyalty, as in Havana, the Federated Malay States, and Ismailia, the work has proved comparatively easy and cheap, while the results (now so well known) have been of the most brilliant kind. I think that Greece, owing to the scarcity of surface water suitable for the larvæ in the summer, will be easier to deal with than any of these places—easier even than Ismailia, with its irrigation system. It will be strange indeed if so intelligent a nation cannot carry out such simple measures in order to rid itself of a plague which has oppressed it for ages.

The Grecian Malaria Society has commenced the work with energy. It has investigated local conditions; has issued numerous tracts to the people; has urged railway companies to screen stations, and Government to undertake drainage. Dr. Savas suggests Government regulation of the sale of quinine in order to improve and cheapen the drug—a most necessary item. At Athens, where malaria exists only along the bed of the Ilissos, the stream has been "trained" in many places. Presently I hope we shall see a survey made of the malaria and the local breeding places in the whole of Greece, preparatory to a general onslaught on the foe. When I was in Athens I had the pleasure of speaking to M. Theotakis, the Premier, and Mr. Boufidis, the President of the Chamber, and am sure that the Government will do its best to support the campaign. But the Society will have to fight many enemies, chief among which will be the incredulity and indifference of the public. I have therefore suggested that we in Britain may help it by doing something to show our support of it. The Liverpool School of Tropical Medicine has accordingly offered its assistance, which has been accepted by the King of Greece; and under the patronage of H.R.H. Princess Christian, we have opened a list of supporters, which now includes many eminent names, beginning with those of the Greek Minister in London, the British Minister in Athens, the Presidents of the Royal Society and the British Academy, the Royal College of Physicians, and many Greeks residing in Britain. It often happens that a little foreign support will do more to encourage a cause than much local effort can do. If any of you wish to join us we shall welcome you most heartily. You have but to write a note to me or to our Secretary, A. H. Milne, Esq., B10, Exchange Buildings, Liverpool.

When matters are in proper train, every year will see the removal of a number of the little marshes which are so injurious to the country—every year will see a decrease in the malaria. I venture to say with confidence that, give us but the necessary means—and we do not require much—there is no country in the world from which we could not extirpate the disease. Hitherto we have contented ourselves with diminishing it in isolated towns. Let us now deal with whole nations. Remember that it has actually been banished from Great Britain, almost by unconscious agencies. We have only to imitate those agencies consciously. What a triumph it will be for that great science, of which all of us are the humble votaries, if she can wipe out this miasm, this defilement, from an entire country. I will not hesitate—such is our ambition. And that country is Greece.

I asked a Greek friend why his countrymen did not restore the Parthenon. He replied it was because they were unwilling to touch the sacred ruins without the assent of the whole world, to whom they belonged. So also Greece belongs to the whole world. We all share in her troubles and should do our best to relieve them. Many years have passed since Byron gave his life for Greece. He attributed her misfortunes to loss of liberty. Perhaps so; but I think that an enemy more inveterate than the Turk has also destroyed her. Not least among the nations, Britain has studied to help her against her human enemies. Should we not help her now against the more potent enemy which we have discovered. That Science which, more than two thousand years ago, she created is at our side urging us on. We have no doubt of the result—we need only to nerve the arm to strike.

Gentlemen, it was my good fortune to stand the other day at a spot from which can be seen within eyeshot the birthplaces of science, art, philosophy, the drama—of Europe, of our modern civilisation. It was a great rock rising in the midst of a city built on a plain—not a boundless uninteresting expanse, but a plain, defined as such by a cincture of beautiful mountains. I have known many of the loveliest scenes of this wonderful earth, but nothing altogether equal to the Attic plain. The rock was the Acropolis; and the setting sun flooded it with light. Upon it rose those ruins which are unsurpassable, unpaintable and indescribable, because they were built, not only for themselves, but for the visions which surround them—the Propylæa, the Erechtheion, the Parthenon. And who was the god for whom that temple was built—which of all those gods, who are not dead as some imagine, but who live now and will live for ever until, as the poet says, "the future dares forget the past"—who live because they are the everlasting types of our own spirit? That goddess whose birth and victory were recorded on the pediments of the Parthenon; who sprang, not from the common zygosis of Nature, but full-armed from the head of Zeus at the touch of Fire and Toil; who conquered the Deep himself. Study her attributes, perceived and recorded in legend by the sages who lived before history was born, and we shall know her. Without human weakness, she led Ulysses through the dangers of the Deep, she gave Perseus the weapons with which he slew the monster of the Deep, she destroyed the city of the Deep, she made Athens triumph over the Deep,

and to-day has lifted man in a few centuries from the Deep to heights unimagined before—Science herself. The Parthenon was the temple of Science. The great figure of Science, standing before it, dominated the whole of Greece. At its gates, even, stood the figure of Hygeia, the Science of Health, whom we now invoke. Science is the goddess whom we serve, as did the ancient Athenians, because we know that she and she alone can save us from these elements of the Deep which oppress us. We are her servants. We honour not the baser gods—the quack remedies, the sham philanthropies, the false knowledges, the mock philosophies, the whining pities, the lying politics which keep men down in the depths. We acknowledge only the intellect which sees the truth and smites the evil. Let us pray Pallas Athena to revisit the land where she was born.

OPERATION LEUCOCYTOSIS.

By P. N. Gerrard, B.A. B.Ch. B.A.O., M.D.(Dublin), D.T.M.H.(Cantab).

Federated Malay States.

As it falls to the lot of surgeons very rarely to profit both their patients and themselves, by what I must insist upon calling a surgical error, the case quoted below, in which both of these happy contingencies occurred, may be of interest to the profession.

Polgadu, aged 23, coolie, Tamil, male, was admitted to Parit-Buntar Hospital on May 29th, 1906, complaining of abdominal pain, and constipation for two days. The abdomen was noted as being distended and tense.

My absence at the time of his admission, on sick leave, prevented me from seeing the case until June 16th, on which date the following symptoms presented themselves:—

The patient was emaciated and evidently suffering, his complaint being entirely referred to the lower part of his abdomen. His temperature rose at night to 102°, and was usually 99° in the mornings. Bowels constipated, urine regular and healthy, save that on the day of his admission it had to be drawn off by catheterisation; his mouth was dry, and his tongue was dry and somewhat furred; his pulse was rapid and atonic.

On examination the abdomen was hard and exquisitely tender, more especially in the middle hypogastrium and bladder region, where a tenseness and an apparent tumour with ill-defined edges existed.

The patient was so ill that I decided upon an exploratory laparotomy next morning.

The diagnosis at that time lay, to my thinking, between the following:—

(1) An antero-cystic abscess; the symptoms in the last case in which I operated having been very similar to those presenting in this case.

(2) An abscess of the appendix, presenting in the median line and involving the pelvic peritoneum.

By analogy I was much inclined to the former.

The patient, after proper preparation, was placed on the table, chloroform was administered, catheterisation performed, and an incision about 2½ ins. long made in the median line about 1 in. above the pubes.

Having made the preliminary incision I cut through the layers of what I believed to be greatly thickened peritoneum (which I had expected to encounter), and in the bottom of the wound what was apparently a coil of intestine presented; as the contents of this protrusion were apparently clear, I came to the conclusion that it was a cyst or hydatid, superficial to the bladder, and incised it, when I obtained clear urine. Passing a catheter, there was no doubt left of my error. On exploring the bladder, however, an interesting condition revealed itself.

The bladder appeared to be divided into two sacs, an anterior and a posterior, or, as the patient lay, a superior and an inferior, the superior being practically cut off or delineated from the inferior by the presence of an oval tumour, formed apparently by distended peritoneum pressing against the posterior surface of the pubes.

The bulging peritoneum contained at least fluid, if not pus, and nothing remained for me to do except to suture carefully the bladder wound, to tie in a catheter for drainage, and to proceed to the major undertaking of opening the peritoneum just below the umbilicus.

I had hardly completed the cystic suture when the patient ceased to breathe, the pulse became intermittent, and all the signs of impending death occurred. Strychnine and ether were promptly administered, and I had already commenced artificial respiration by thoracic pressure, but as no response was apparent I started to respirate by the Silvester method; this, to my surprise, could not be carried out, as all the patient's muscles were in a state of tonic contraction. The dose of liq. strychnine administered was 4 minims. I continued for about ten minutes the intermittent thoracic pressure, but as the pulse apparently failed, respiration showed no signs of becoming re-established, and the pupils became fixed, I gave the case up as dead, and went to wash my hands, full of vain regrets and disappointment. Before thirty seconds had elapsed, however, respiration recommenced, the pulse returned, and the patient became sufficiently well to be removed to his ward, but not, in my opinion, sufficiently recovered to proceed to the completion of the operation.

Owing to a sudden outbreak of cholera in the district some miles away I was unable to see my patient until Monday, the 18th. His temperature had fallen to normal I found, after the operation, and had remained normal, his abdomen was soft, and he was free from pain, his general condition was good, and he asked for full diet; his pulse was good, his tongue clean, the bladder had acted normally, and he appeared to be on the road to recovery from all his ailments.

The case made an uneventful recovery, and primary union of the bladder and of the superficial wound took place. He left hospital, fat and well, about three weeks after his operation.

I believe the symptoms to have been due to an atonic and distended anterior portion of the bladder, that peritonitis with effusion was present in the first instance, and that the case was cured by a determina-

tion of blood supply, and a concomitant local leucocytosis to the pelvis.

This case might well suggest, in these days of cleanliness, a more frequent exposure of the peritoneum in cases of effusion from any cause, with a view to the absorption of the fluid by means of stimulation of the pelvic lymphatics and blood supply.

To the Editors of the JOURNAL OF TROPICAL MEDICINE.

DEAR SIRS,—I beg to forward an account of an epidemic of dengue which attacked Port Sudan this year—Port Sudan being a new town, and the seaport of the Sudan.

I may say that dengue fever does every year show itself at Suakim, although not there located in the text-books. We have had also this year a very sharp outbreak of quinine dengue at Halfa. I presume that it made its way along the new Suakim-Atbara Railway to this inland town.

There are so many fevers out here, diagnosed as simple fever, simple continued fever, sun fever, local fever, &c., that it is a relief to get one disentangled and nailed down and labelled, so to speak. There is another Sudanese fever, although rather a twenty-one days' fever than an eight day, which may be mistaken for typhoid (but it is without abdominal symptoms), or Malta fever (but it is without throat or joint symptoms); it relapses, however, and differs from malaria, in that it does not yield to quinine.

It might be called low tropical fever, for it requires change of locality for its cure. It also requires naming. It is, I think, different in its temperature chart from the typhoid type, in that the fever is rather of the intermitting type than the remitting.

Yours faithfully,

J. B. CHRISTOPHERSON, M.D., M.R.C.P., F.R.C.S.,
Director Sudan Medical Department and Physician to H.E. the Governor-General of the Sudan.

Sudan Government,
Medical Department, Khartoum,
September 25th, 1906.

DENGUE IN PORT SUDAN—RED SEA PROVINCE, SUDAN.

By SELIM SAIGH, M.D.
Medical Officer in Sudan Medical Department.

THE disease appeared this year as an epidemic in Port Sudan, the new seaport of the Sudan. The first case entered the hospital on May 29th, 1906. From that time it increased rapidly, affecting one part of the town, then the other, so that by the end of August a very large number had been attacked.

It affected equally white and coloured people, and both sexes, and men of every age, except young infants. One attack did not confer immunity, many patients having more than one attack. The incubation period was from two to four days.

Etiology.—Probably the carrier of dengue is the mosquito. The present epidemic affected chiefly the houses where it was found, and the disease reappeared when there was an increase of mosquitoes in the town.

It was especially remarkable that all people living in the hospital escaped, though by that time the wards were full of cases of dengue. The hospital was the only place free from mosquitoes: though we were very careful to destroy the larvæ present in our water; this was the only precaution that was taken.

Onset.—The onset is very sudden, usually coming on in the afternoon. Prodromata are rare, and when present they consist of headache, anorexia and rheumatic pains. The disease is rarely ushered in by a chill. A patient describing his attack said: "I have been out to work all day, feeling the same as usual; about sunset I had headache, and feeling tired I sat on a chair to rest; suddenly I began to have pains all over, and half an hour later, when I had to go home, I was so stiff that two men had to support me all the way home."

Such onsets are very common, and it is usually in such a manner that the disease begins. The fever then develops rapidly, and with it the headache, and the pains in the neck and eyeball increase; the pains in the loins, thighs, knees, and calves are very characteristic and are almost always present; in a word, all the body is stiff, and the least movement is painful; during the night the patient is unable to sleep and very restless.

Circulatory System.—Dengue does not affect the heart except by raising the pulse from 90 to 120, and in very severe cases to 130. Sometimes there is profuse epistaxis, and this often relieves the headache and brings down the fever.

Respiratory System.—The most important difference between influenza and dengue lies in the fact that the latter does not give rise to pulmonary symptoms. There might in some cases be a mild laryngeal catarrh and bronchitis. The respiration during an attack of dengue is accelerated.

Digestive System.—There is often with the first symptom very severe pain in the stomach, with vomiting, but these usually subside after the first two or three days. The tongue is coated during the attack, and begins to clear when the fever falls: there is a complete loss of appetite. During the first three or four days there is constipation, which is sometimes followed by diarrhœa, in some cases persisting for a time after the attack has subsided.

Spleen and Liver.—The liver and spleen are not affected; in two cases there was an enlarged spleen, but this was probably due to the fact that the patient had malaria before.

In the beginning of an attack there is often a deep flushing of the face, but the real eruption does not begin until the third or fourth day. It is present in most cases, and consists of roseolæ of the size of a pin's head, dark in colour, coalescing and forming patches of different sizes; this eruption affects the face, neck, back, forearm, and hands, in some cases extending to the thigh. The eruption begins to fade when the fever goes down, and in a short time the skin desquamates, peeling off in small flakes.

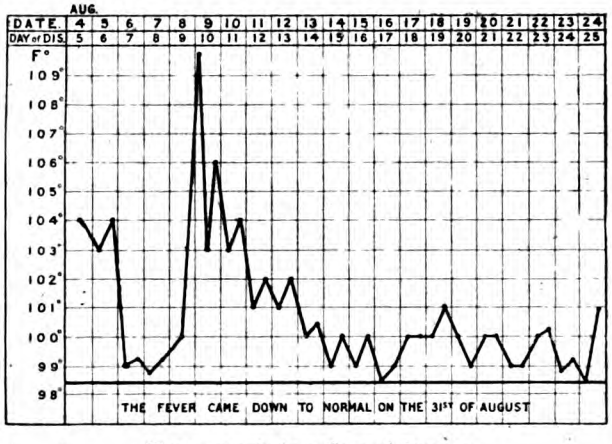
Kidney and Urine.—In the great majority of cases the urinary system is not affected, a few patients had albumin, and all of these had an attack of epistaxis.

Nervous System.—The pains in the head, neck and eyes are the only troubles set up in the nervous system.

General Course of the Fever.—After the onset the fever increases rapidly, rising as high as 103° or 104,° and is continuous in character, there being not more than one degree difference between the morning and the evening temperature. With the increase of the fever all the symptoms augment in severity; this goes on for five or six days, the fever falls then by crisis, usually in the afternoon. The pains and the rash then begin to disappear, and the patient becomes convalescent.

In mild cases the fever falls to normal in the second or third day, such cases have mild symptoms, but in severe cases, especially when there are complications, the fever is protracted, falls by lysis, and recovery is very slow.

An attack leaves the patient very weak and debilitated, the pains in the thigh, knees and calves may persist for some time, rendering motion painful and difficult, but gradually the tongue gets clean, the appetite improves, and the patient is able to resume his work.



Hyperpyrexia in a Case of Dengue.

Complication.—The most severe complication is hyperpyrexia, but luckily it is a rare one, and appearing in the very hottest part of the year; in these cases the patient, after a protracted attack of dengue, suddenly develops hyperpyrexia, the temperature rising as high as 108° or 109°, this sudden attack usually happens between 1 and 3 p.m., a comatose condition supervenes, with a very weak pulse and stertorous breathing; if he is able to survive the high temperature he will probably have another rise in the evening, but this time only to 105° or 106°. The next day his temperature reaches 104°, falling down very slowly by lysis. Such attacks are always followed by severe bronchial catarrh, their duration is very protracted, leaving the patient weak for a long time.

Mortality.—Only two cases died of dengue, both of them Europeans. Both had long standing emphysema. After a protracted attack they developed hyperpyrexia with all its concomitant symptoms, and succumbed in a very short time.

Death was caused by asphyxia, as the bronchi were full of mucus, rendering respiration impossible. Probably hyperpyrexia, due to the fact that the disease affects the brain and meninges. The other complications have already been mentioned. They consist of rheumatic pains, epistaxis, and, rarely, albumin in the urine and bronchitis.

Diagnosis. — The only disease which resembles dengue is influenza, but the roseolar eruption, the lack of pulmonary symptoms and the rheumatic pains render the diagnosis easy.

Treatment.—The disease has a special course to follow, and there are medicines to help it abort, or cut it short. I found that the following prescription is effective by relieving the pains.

℞	Sod. salicylate	10 grs.
	Sod. bicarb.	10 grs.
	Tinct. aconit.	2 mins.
	Aqua.	1 oz.

Liniment of belladonna and stimulants applied externally might also relieve the pain. As to hyperpyrexia, immediate sponging with ice till the temperature falls to 99° or 100°, with strong doses of strychnine; this is to be repeated if the temperature gets higher again. As a tonic nux. vomic., quinine, and iron, are necessary during convalescence when the attack has been severe, followed by change of climate as soon as the patient is able to move.

"Lancet," October 20, 1906, p. 1,064.

"A New Aspect of the Pathology and Treatment of Leprosy.

Black, Dr. Robert Sinclair. In a short but extremely suggestive and interesting paper, the author details some conclusions he has reached during seven years' experience of the Cape Government establishment for the isolation of lepers on Robben Island.

Dr. Black entirely disbelieves in Mr. Jonathan Hutchinson's fish-eating theory of the disease, and appears to regard contagion as the only possible method of communication. He believes that in most cases the bacilli first attack the nasal mucosa, causing a mild chronic rhinitis which is rarely if ever noticed by either the patient or his medical attendants as a symptom of leprosy.

It is in this condition that the disease is usually communicated to others, and Dr. Black believes that the early recognition and treatment of this condition would go far to limit the spread of the disease, not only to others, but also within the tissues of the person already attacked, believing that the lesions are at first superficial and probably remediable by surgical measures.

He further believes that leprous erythema is caused by a toxæmia, the toxins being, however, derived not from the leprous bacilli, but from the abundant staphylococci and streptococci which are always to be found in leprous ulcers.

"Münch. Med. Woch.," July 24, 1906.

Agar-agar in Chronic Constipation.

What seems far-fetched physiological reasoning has been applied to the treatment of chronic constipation. Agar-agar in one or two tablespoonfuls with (when it is called regulin) or without cascara, is administered daily for a few days until the bowels act, when it is gradually reduced to a teaspoonful. The idea is that the agar-agar swells in the intestine, and promotes peristalsis by the bulky nature of the contents it induces.

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THE

Journal of Tropical Medicine

NOVEMBER 15, 1906.

THE CASE OF THE INDIAN HOSPITAL ASSISTANTS.

NOT long ago we had occasion to note the dissatisfaction of the vernacular students of the Lahore Medical School with the conditions under which they worked, and it was pointed out that the agitation could not in any sense be described as factious, as it was undoubtedly based on legitimate causes of dissatisfaction.

The last received issue of the *Pioneer Mail* now brings us the news that "the Medical School Club of Agra, acting on behalf of all medical students and Hospital Assistants, has issued a number of memorials to all the provincial heads of the medical departments in India, praying for an amelioration in the pay and prospects of a class of public servants who, in the opinion of the Club, do not enjoy that measure of official consideration and patronage to which they are entitled. The complaint is confirmed by the various official reports, which agree in emphasising the necessity of raising the status of Hospital Assistants. In spite of these repeated representations, however, nothing seems yet to have been done. It is stated that the demand on the services of hospital assistants has of late grown beyond their ability to meet it. In many cases, owing to the outbreak of plague, cholera, or some other epidemics, their leave of absence is stopped, while even normally their pay scarcely corresponds to the amount of work expected from them."

It will be observed that the memorialists are acting in a perfectly moderate and constitutional manner, in pleasant contrast with the methods usually adopted by the Indian college youth when he thinks himself aggrieved; and, apart from the traditional loyalty of the Hospital Assistant class, this may be taken as an indication of their conviction of the goodness of their case.

It cannot be denied that the class is wretchedly paid in proportion to the amount and responsibility of the work expected of it, and the scale of remuneration, moreover, compares ill with that accorded to public servants, drawn from a similar class of Indian society, belonging to other departments.

The pay of civil Hospital Assistants "with English qualification," *i.e.*, if capable of reading and writing English, commences at Rs. 25 *per mensem*, and rises to Rs. 55 (or from £20 to £44 *per annum* about.)

In the executive branch of the Civil Service, the "Teshildars," whose nearest European representatives would be French *maires*, commence at Rs. 50 and attain to Rs. 250 per mensem, equivalent to £40 to £200 per annum. In the forest department the pay of the corresponding subordinates, or "Rangers," commences at Rs. 50, and reaches Rs. 150, with the probability of promotion to "Extra Assistant Conservator," drawing, in the highest grade, Rs. 350, or about £280 per annum. In the police department, the pay of inspectors runs from Rs. 50 to Rs. 200 per mensem.

Now, the Hospital Assistant class are undoubtedly fully the equals of the members of the contrasted departments in intelligence and education, and are drawn from much the same strata of native society, those, in fact, which most nearly correspond to our "middle classes."

The teshildars, no doubt, usually belong to more influential families than those from which the other departments are recruited, but are in no way superior in education and intelligence, while, on the other hand, the inspector of police is usually promoted from the ranks, and though selection for promotion doubtless implies ability above the average, they are often of humbler social origin than the medical subordinate. Like the hospital assistants, the subordinates of the forest department are specially trained in a Government college, mainly at the public expense.

It is difficult to see any just reason for this extraordinary difference of treatment, for it will be seen that the medical subordinate's pay finishes pretty much about the scale at which the others commence, but the depreciation of medical work runs right through all branches of the department, the pay of assistant surgeons, though fully qualified medical men, comparing almost as poorly with that of the corresponding "Extra assistant commissioner" of the executive Civil Service. The excuse given would probably be the old tale of emoluments gained in private practice, but on this matter the hospital assistant, in common with all other exponents of the European system of medicine, has been hardly hit by the wave of unpopularity and distrust that has possessed native society against all its professors as the outcome of plague and the

measures adopted to cope with it; and it is probably this circumstance that has brought the service to the stage of petitioning Government for better treatment.

Even allowing for the cheapness of living in India, Rs. 25 per mensem is starvation pay for a man who has been raised by education to an entirely different standard of civilisation from that of the ordinary coolie, and it is no better than cruelty to take an Indian lad, and after converting him into a civilised and thinking man, to pay him somewhere about the wages of a decent butler or cook. It must not be forgotten that practically all are married men with families.

During the recent troublous times of famine and plague in India, the loyalty and pluck of our medical subordinates has been above all praise. They undoubtedly form the backbone of our system of medical relief, and we trust that the powers that be will turn a sympathetic ear to the petition alluded to in our Indian contemporary, and will do something to alleviate the hardships of a hardworking and estimable body of men.

AN APOLOGY.

I REGRET to learn that the letters and notices concerning the memorial to the late Professor Schaudinn were inserted in the JOURNAL OF TROPICAL MEDICINE of November 1st, under a misapprehension. It appears that the letters I received were intended for private circulation only, and those who have charge of the memorial in this country are deeply concerned that the letters were published. Seeing that the letters were printed and not marked private or confidential, it did not occur to me that they were not public property.

I beg to apologise for the error I made in publishing the correspondence, but it was done with the intention of advocating the cause so many of us have at heart, namely, a fitting testimony to the memory of a man all must revere. I write this in the first person as I did not consult any of my colleagues on the matter, believing that it was a matter of public duty to publish the letters at the earliest possible date. It falls to me personally, therefore, to make my humble apology.

JAMES CANTLIE.

MALARIA IN GREECE.—PROPOSALS FOR ANTI-MALARIAL MEASURES.

(Issued by the Liverpool School of Tropical Medicine.)

PROPOSAL FOR FIGHTING MALARIA IN GREECE.

DEAR SIR,—The Chairman and Committee of the Liverpool School of Tropical Medicine, in publishing the annexed appeal for subscriptions in aid of the Grecian Anti-Malaria League, wish to state:—

(1) That in reply to a telegram from the School, H.M. the King of Greece has signified his acceptance of any help that the School can give to the League of which he is the Patron.

(2) That H.R.H. Princess Christian, Honorary President of the School, has graciously consented to be the Patroness of the subscription in Great Britain.

(3) That Sir Francis Elliot, G.C.V.O., K.C.M.G., H.B.M., Minister at Athens, has kindly promised to receive the amount subscribed, and to hand it over to the Grecian Anti-Malaria League.

(4) That support to the scheme has already been promised by those whose names are printed in the accompanying list.

(5) That subscriptions may be paid to the Secretary, Liverpool School of Tropical Medicine, B10, Exchange Buildings, Liverpool.

ALFRED JONES,
Chairman, Liverpool School of Tropical Medicine.

The Liverpool School of Tropical Medicine, B10, Exchange Buildings, Liverpool.
July, 1906.

MALARIA IN GREECE.

By RONALD ROSS, C.B., F.R.S.

Professor of Tropical Medicine, University of Liverpool and Liverpool School of Tropical Medicine.

A LITTLE while ago I was asked by the Lake Kopais Company to make a study of the malaria which has long been prevalent on their estates in that part of Greece. Permission being granted by this University and School, I went there last May and carried out the required investigation. It revealed an unexpectedly high degree of malarial infection in most of the localities examined. Moreover, I ascertained from members of the Grecian Anti-Malaria League that the district of Kopais is by no means exceptional in this respect, and that the malady is very prevalent in many rural areas throughout the country. The League, which has existed for some years, has been doing its best to improve matters by modern methods, but is much hampered by lack of funds. After consideration, therefore, I have come to the conclusion that the case is one in which a little assistance from this country may do a great deal, and that we might well be justified in attempting to raise some small subscription among Greeks and other lovers of Greece resident in Britain, for the purpose of supporting so deserving a body.

Details regarding the prevalence of malaria in Greece are as follows: Professor Dr. Savas, Physician to H.M. the King of Greece and a Vice-President of the League, informed me that, taking the statistics of the larger towns for a basis (probably the lowest possible basis), the *average annual* number of cases must be something like 250,000, and deaths about 1,760. He said also, that malaria was particularly prevalent in Greece last year, the number of cases being perhaps half as numerous as the population.

From Dr. Kardamatis, General Secretary of the League, I obtained the following figures for last year:—

Estimated population of Greece ...	2,433,806
Estimated number of cases of malaria	960,048
Estimated deaths from malaria ...	5,916

It is always difficult to arrive at any exact estimate of the amount of malaria in any country; but these data appear to have been collected with all due care, and are certainly serious and startling enough for a European nation. It would appear that *in a single year*, there were roughly two attacks for every five persons in the country. Fortunately malaria, though

it is an extremely troublesome malady, is not often fatal; yet one in about every 410 persons seems to have died of it last year alone. I was informed also that blackwater fever, the most fatal form of the disease, often occurs in certain rural areas.

I will now describe my own experiences. It will be remembered that the Kopaic Lake was a large stretch of fresh water situated north-west of Bœotian Thebes at the feet of the slopes of Parnassus and Helikon. It was frequently drained by the ancients, and as frequently allowed to lapse again into the condition of a large marsh (in winter). Recently it has been kept well drained by the British Lake Kopais Company, the surface of the large plain so formed being used for extensive cultivation. On the margin of the plain there are a number of villages, some of which were examined by Dr. Kardamatis and myself, with the valuable assistance of Mr. D. Steele, agent of the Lake Kopais Company in Greece. The first method which we adopted for estimating the amount of malaria present was one which gives very reliable results when used with proper scientific precautions—namely, an examination of the people, chiefly the children, for enlargement of the spleen. Our general result was as follows: Out of 373 people examined enlargement of the spleen was observed in 96, or 23 per cent. But, in considering this ratio it must be remembered, first, that enlargement of the spleen is indicative, not only of a malarial infection, but generally of a long continued one; and, secondly, that the investigation was carried out in May and June, that is before the commencement of the annual autumnal malaria season. There is no doubt that an autumnal investigation would have disclosed a ratio of infection much higher even than this.

To give further details—at the village of Moulki, which is situated near the ancient Haliartos on the Kopaic Plain itself, we examined 80 persons and found enlargement of the spleen in no less than 38, or nearly half. At the village of Mazi, on the slopes of Helikon, just above Haliartos, we found it in 13 out of 40. At Skripou (the ancient Orchomenos) situated on the edge of the plain, it occurred in 25 out of 50 school children—exactly half. At the town of Livadhia, although it is at a distance from the Kopaic Plain and some way up the slope of Helikon, and is watered by running streams rising near the ancient Oracle of Trophonios, enlargement of the spleen was found in no less than 16 out of 100 school children. On the other hand, on the Kadmeia of Thebes, it occurred only in one out of 50 children.

Another method of estimating the amount of malaria present, namely, by searching preparations of the finger blood of the people for the parasites which cause the disease, need not be referred to here as the examinations are not yet complete; but so far as they have been carried they fully confirm the spleen-test, which of itself is sufficient for Greece. All the kinds of parasites have been readily found; and there can be no possible doubt regarding the wide prevalence of the disease. Many of the unfortunate little children, as they filed past us in the schools, presented a sad spectacle—pale and wizened, with enormously enlarged spleens and frequent attacks of fever. I have seen nothing worse in the most malarious parts of India; and nothing so bad in Africa, where there is probably more racial immunity. I suspect that there is a much larger infantile mortality in Greece than is shown by the statistics; and also that the adults, partially immunised as they are, cannot but lose in health and vigour in consequence of the unhealthy childhood which they must frequently pass through.

The question as to how far malaria has influenced the past history and the modern development of Greece, is one of the greatest interest, and will, I hope, receive future consideration. We must remember that nearly the whole surface of the country is mountainous, the arable tracts consisting of but a few small valleys or plains, maintaining most of the rural population. Yet it is precisely in these vital areas that the disease is most prevalent. True, some of the larger towns seem to be much less affected; but a nation can scarcely depend for its prosperity on its urban population alone. It is difficult to see how a vigorous country life can exist under the conditions which I have attempted to describe. One would expect to see many villages, churches, inns and country houses scattered about the landscape. The villages are few and poor, the country houses almost entirely absent. A gentleman in Athens told me that he bought a shooting box, but that when he went there he was immediately attacked by malaria. One would expect also to find plentiful accommodation for travellers all over a country where almost every hill, rock or stream is sacred to literature, art and history—which should be visited annually by thousands of tourists from all parts of the world. In reality we now see throughout these great valleys little more than what may almost be called scenes of desolation—bare hills, empty plains, a poor and scattered population.

Many years have passed since Byron gave his life for Greece. He attributed her misfortunes to loss of freedom. Is it possible that an enemy more inveterate than the Turk, has been really the cause of them? Looking at those poor children in the villages I feel inclined to think so.

Britain has done something for Greece in the past; and may now help her again, and perhaps in a more effective manner. Science has at length taught us how to combat malaria on a large scale. Ismailia, Havana, the Campagna, Hong Kong, Khartum, the Federated Malay States, give conclusive evidence of this; and so far as my own experiences teach me, the task in Greece will be a comparatively light one. Owing to the dryness of the climate and to the fact that the heavy rains fall in the winter, pools of water suitable for the propagation of the malaria-bearing gnats seem to be so small and isolated that they could easily, I think, be rendered uninhabitable for the insects; while the people are so intelligent that they are likely to accept readily enough the numerous other anti-malarial measures which may be adopted. Indeed, I will venture to say, that if the work is undertaken with the same degree of intelligence and persistence as was shown in the places just mentioned, the disease ought to be nearly banished from Greece in five years, and, moreover, at comparatively little cost. Such a result would be a most glorious victory, not of nation against nation, but of science against one of the principal enemies of mankind.

As I have said, the Anti-Malaria League of Greece, of which H.M. the King of Greece is Patron, has already commenced the battle, and I can testify has done so in a thoroughly practical and scientific manner. Its own duties are to indicate with exactness the sources of malaria near the principal towns and villages, to advise the Greek Government regarding the necessary measures, and to rouse the people to defend themselves by the simple precautions which are now so well known to medical men. All that we have to do—citizens or lovers of Greece in this country—is to try to help the League with funds and with sympathy. The former will enable it to do the necessary work; the latter will stimulate the Greeks themselves to aid in the task. With regard to the Government of H.M. the King of Greece, I can say confidently that we may fully rely upon its sympathy with the cause, and I say this, not as a mere compliment, but as the result of impressions gained by me during interviews with M. Theotokis, the Premier, and M. Boufidis, the President of the Chamber.

In conclusion, I can say with confidence that every penny spent in this cause is sure to give immediate and lasting benefit to Greece. For every tract distributed among the people, every pool of disease-breeding water drained away or filled up, there will be a corresponding saving of health and life; and, as the work progresses year by year, the hold of malaria on that beautiful country will be gradually relaxed until it is finally loosed altogether. The disease will disappear from Greece as it has disappeared from Britain.

Translation.

THE DISTRIBUTION OF BLOOD-SUCKING INSECTS IN WEST AFRICA.

By Dr. H. Ziemann.

The increase of the scientific and practical importance of the blood parasites, as regards tropical pathology, has also greatly augmented the interest taken in those animals which we know to propagate diseases of the blood. I am especially thinking of the great zeal shown in the collecting of Anopheles in all parts of the Tropics. Already in the years 1899, 1900, the writer of this paper endeavoured to collect the principal blood-sucking insects of Kamerun, Togo, and Liberia, and to urge further investigations in that direction.[1] But the untimely death of the zoologist, Müggenberg, unavoidably delayed the idea; in the meantime Theobald and Giles filled up the gaps in our knowledge of the *Culicidæ* of Africa.

In addition to the *Culicidæ* found in 1899, 1900, we are pleased to say that we also succeeded in demonstrating the presence of *Stegomyia fasciata* over wide areas; however, according to a letter received from Eysell, our species appears to differ from the specimens found in Habana. As is well known, *Stegomyia fasciata* is the transmitter of yellow fever. So far this disease has not been found in Kamerun, but once, in 1887, it was present on the west coast, and penetrated southward as far as Old Calabar, close to Kamerun.

Dr. Grünberg was able to distinguish the following species amongst the *Culicidæ* collected by me:—

(1) *Culex fatigans*, Wiedem.
(2) *Culex dissimilis*, Theob.
(3) *Culex masculus*, Theob.
(4) *Mansonia africana*.
(5) *Eretmapodites quinque costatus*, Theob.

Of these *Culex fatigans* is of importance as a probable transmitter of Filaria disease.[1] European Culices, such as *Culex pipiens* (which occurs also in Algeria); *C. nemorosus*, *C. annulatus*, &c., were not found.

Moreover, we succeeded in demonstrating the presence of piroplasmosis in animals[2] in all the domesticated animals of Kamerun, in the coast regions, and this disease may, in the case of native oxen of Kamerun, be distinguished from real Texas fever, viz., (1) by its comparative mildness; (2) by the lack of the typical pear-shaped forms of real Texas fever parasite, and (3) by the absence of hæmoglobinuria. The piroplasmosis of asses and cats, on the other hand, took a malignant course. Later, when out in South Africa, R. Koch also described, under the name of coast fever, a malignant piroplasmosis of oxen which has to be distinguished from real Texas fever. For this reason, earnest attention was paid to the *Ixodidæ*, in fact, to all parasites of mammals, and these were systematically collected. All stations have the duty to continue collecting and to send the material gathered to the State Hospital in Duala, which is the central station, for further use.

The difficulty of identification is very much enhanced by the fact that we may find on the same animals various species, and even different genera of *Ixodidæ*. Thus, for instance, I found on goats in Togo (Lome), *Rhipicephalus evertsi* (G. Neumann), and *Rhipicephalus simus* (C. L. Koch). I also found on oxen in Lagos, *Rhipicephalus annulatus* (Say) as well as *Ablyomma variegatum* (Fab.), on elephants in Kribi; *Dermacentor circumguttatus* (G. Neumann), and *Amblyomma tholloni* (G. Neumann). Further, in oxen in Lagos, *Hæmaphysalis parmata* (G. Neumann), and *Trichodectes sphærocephalus* (Nitzsch). It is true, this latter parasite does not belong to the *Ixodidæ*, but to the lice, but I mentioned it here for reasons of differential diagnosis.

We may be quite sure that, as investigation goes on, the frequency of the occurrence of different species of blood-sucking *Ixodidæ*, living on the same host, will increase. Generally speaking, it is certain that the species found in Upper Guinea differ slightly from those of Lower Guinea, but *Rhipicephalus annulatus* (Say) is the species which has the widest distribution. This tick is generally supposed to be the transmitter of the malaria of oxen (Texas fever). Next in order of frequency in Upper Guinea, is *Amblyomma variegatum*

[1] Ziemann. "Beitrag zur Anopheles-Fauna West Afrikas.," *Arch. f. Schiffs und Tropenhyg.*, 1902, Bd. vi.

[1] Ziemann: "The Filaria Disease in Man and Animal in the Tropics," *Deutsche Med. Wochenschr.*, 1905.

[2] Ziemann: "Preliminary Report on the Occurrence of Tsetse Disease in the Coast Regions of Kamerun"; "The Occurrence of Texas Fever in the Oxen of Kamerun, and More Information Concerning Tsetse Disease and Malaria of Animals," *Deutsche Med. Wochenschr.*, 1903, Nos. 15, 16.

to be found. It is very remarkable that I was also able to demonstrate the presence of *Amblyomma variegatum* on oxen in Bamenda, a mountainous highland, forming the hinterland of Kamerun. As a matter of fact the fauna of the further hinterland of Kamerun shows great similarity to that of Upper Guinea and the Western Soudan. In Lower Guinea, at any rate, in the coast region up to the foot of the mountains, the widest distributed genus seems to be a tick which has been named by Neumann, *Hæmophysalis parmata*. In addition to this species, Neumann found on the oxen of Kamerun a *Rhipicephalus ziemanni*. Its further zoological description I leave to Professor Neumann himself.

I think that we should draw up lists of all the parasites found in each colony, till finally, by having compared and interchanged the different lists of the different European colonies, we shall be able to get at the knowledge of the distribution of the principal blood-sucking parasites. The questions put to each single colonial district for the purpose of ascertaining the diseases of its animals, should in due time be answered, and these answers communicated to the other colonies.

Thus gradually we may hope to attain our purpose and to establish a comparative pathology of the animals in the African Tropics.

These were the reasons which prompted the writer to make also a collection of the flies which are known to transmit trypanosomes. Their identification has not yet been fully carried out. I will only remark in this connection that, according to Grünberg, *Glossina longipalpis* (Wied.) and *Glossina morsitans* (Westw.), transmitting, as we know, the Nagana disease, have not yet been found in the coast regions of Kamerun, though nevertheless the infection of the domestic animals by trypanosomes is very widely distributed. In Kamerun the following are known:—

(1) *Glossina palpalis* (Rob. Desv.), which is accused of carrying the trypanosome of sleeping sickness. (Found in several places, such as Victoria, Buea, Barombi, &c.) My own investigations lead me to believe that sleeping sickness on the coast only occurs sporadically, and even then it is imported; but it occurs more frequently in the hinterland. All imported cases therefore should be carefully isolated.

(2) *Glossina fusca* (Walk.), *seu tabaniformis*, Westwood, caught in the neighbourhood of the station Johann Albrechts Höhe (where there is also a trypanosomiasis of the domesticated animals).

(3) *Glossina tachinoides* (Westw.), from the Lake Tschad, which probably transmits a sort of tsetse-disease in the hinterland. Recently I received some blood films prepared from diseased animals, but they reached me in a useless condition.

Stomoxys and Tabanidæ, however, seem to be more widely distributed than the Glossinæ. The former constitute a veritable pest in some regions, as for instance in Mungo, especially *Chrysops dimidiatus* (van der Wulp). The domesticated animals in Duala harbour trypanosomes which may be distinguished clinically and morphologically from the Nagana parasites, and my observations tend to show that these Trypanosomes may be transmitted to the domestic animals by Stomoxys, or as is probably the case in Suellaba (Kamerun) by Tabanidæ. In the Philippines this seems to be the case as regards surra.

According to Grünberg it is possible that new species may be found amongst the Stomoxys and Tabanidæ sent from Kamerun.

The further biological investigations into the life habits and especially the breeding habits of these insects are therefore of the greatest possible importance, especially because we have to reckon on the possibility that the trypanosomes which are sucked up by the blood-sucking fly, together with the blood of the attacked animal, may be transmitted to the progeny of the insect in question. For further particulars on these practical and important questions we refer to Ziemann, "Beitrag zur Trypanosome infrage," *Centralblatt für Bakteriologie*, 1905, Heft 3, 4.

B. R.

Review.

A Few Hints on the Care of Children at Sea. By Samuel Synge, M.A., M.D., M.A.O., B.Ch.(Dub. Univ.), L.M. London: J. Bale, Sons and Danielsson, Ltd., 83-91, Great Titchfield Street, W. Price 1s. net.

This excellent little book will become popular, and if it can be brought to the notice of passengers who have children in their charge will be universally sought after. Dr. Synge has really supplied what is often jocularly referred to as a long-felt want, but in this instance the legend is absolutely true. The "few hints," not only medicinally, but on every detail of child-life on board ship, are eminently practical, and show that the author has had experience of children at sea and has thought out carefully what is necessary in the way of preparation for the voyage and for application during the voyage. The "few hints" ought to be in the hands of every mother or nurse about to proceed to sea in charge of young children, for the instructions it contains will bring comfort to many an anxious and perplexed mother who has to proceed on a voyage with her infant child.

Correspondence.

PNEMONIC FOR THE SOLVENTS OF THYMOL.

To the Editors of the Journal of Tropical Medicine.

Sirs,—As the following pnemonic may prove as useful to others as it has to my dressers, I publish it in the interests of our tropical patients.

The solvents of thymol are of the greatest importance in the Tropics, where ankylostomiasis and other parasitic diseases of the intestinal tract exist in a far greater degree than at home.

The pnemonic is the word "Cottage (with one T)." The drugs represented by this word are: C, chloroform; O, oils; T, turpentine; A, alcohol; G, glycerine; E, ether.

There is no necessity for me to make any long statement on this subject, and I trust that others may profit in the comparative certainty of the non-occurrence of mistakes by the administration of solvents of this excellent drug to the same extent as I believe I have.

Krian, Federated Malay States, *October* 10*th*, 1906. P. N. Gerrard.

Back Row: J. A. Knebel, W. A. Trumper, W. Cammack, A. B. S. Powell, G. B. Warren (Laboratory Assistant). J. G. F. Hosken, P. H. Pereira, E. J. Maxwell, C. F. Fothergill, J. C. Venniker, R. Howard, F. O. Stoehr, H. McG. Newport, P. M. Rennie.
Third Row: Dr. C. W. Daniels (Medical Superintendent), R. McKay (Second Laboratory Assistant), C. C. Robinson, Miss M. Kidd, Miss B. Cunningham, Mrs. W. Cammack, H. Heikinheimo, G. F. Stooke, Capt. J. M. Phalen (U.S. Army), W. W. Woolliscroft, H. B. G. Newham, R. F. Williams, F. I. M. Jupe, H. W. Gush, A. H. Wilson.
Second Row: A. McD. Dick, D. Giordani, Major J. B. Smith, I.M.S., Major R. H. Castor, I.M.S., Major S. A. Harriss, I.M.S., O. Bluhme, E. P. Caropoulos, Sir Francis Lovell, C.M.G. (Dean), Sir Patrick Manson, K.C.M.G. (Lecturer), Prof. A. De Carvalho, Mr. K. W. Goadby (Lecturer), J. C. Baggs (House Surgeon), W. J. von Winckler, E. W. Graham.
Front Row: Miguel Paz, K. R. Tampi, W. B. Orme, A. Finlay (Junior House Surgeon), F. M. Suckling, A. T. Stanton (Demonstrator).
Absent—A. H. Reid, P. R. Egan.

LONDON SCHOOL OF TROPICAL MEDICINE.

22nd Session. October-December, 1906.

Bale and Danielsson, Ltd., London.

Notes and News.

MALIGNANT DISEASES IN CHINA.—Dr. J. Preston Maxwell, in practice at Eng-Chhun, Amoy, China, in his report of hospital work at Eng-Chhun in the *China Medical Missionary Journal*, May, 1906, states: "One of the features of the year's work has been the number of new growths which have come under treatment; certainly there is no lack of malignant disease in this region."

UNION MEDICAL COLLEGE, PEKING.—The Union Medical College was opened on the 14th of February, 1906. The professors and lecturers are drawn principally from the missions in the North China Educational Union and from co-operating missions. Chinese tutors are also included in the teaching staff.

The College has been established to provide well-educated Chinese with as thorough a knowledge as possible of the various branches of medicine and surgery. The degree of Doctor of Medicine will be conferred upon those students who succeed in passing the final examination.

The preliminary examinations are held in February in each year in the College. Candidates desiring to enter for the next college year should be in Peking before February 22nd, 1907, and should communicate with the Dean on their arrival.

The following are the members of the Faculty: Thomas Cochrane, M.B., C.M., Dean; Nehemiah S. Hopkins, M.D.; James H. Ingram, M.D.; George D. Lowry, M.A., M.D.; Charles Lewis, M.A., M.D.; Joseph F. Griggs, M.A., M.D.; Ernest J. Peill, M.B., Ch.B., F.R.C.S.(Edin.); Charles W. Young, B.S., M.D.; W. H. Graham Aspland, M.D., C.M., F.R.C.S. (Edin.), M.R.C.S., L.R.C.P.(Lond.), and thirteen other lecturers.

The medical course covers five years of nine months each. The year begins on or about the 20th of the Chinese first month and continues until the 20th of June; the autumn term begins on or about the 20th of September and continues until the Chinese New Year.

A CHINESE PRESCRIPTION.—Dr. W. H. Jeffreys, in an article in the *China Medical Missionary Journal* of May, 1906, gives the formula from a Chinese prescription for a cough. The prescription gives the patient's name, the diagnosis of the trouble, a statement of the condition of the pulse by which the diagnosis was made. The drugs are to be wrapped in a separate white paper and then altogether in a red sheet. The thirteen drugs are as follows: Baked barley, sugar, mashed beans, bamboo shavings, a root, another root, still another root, chalk, melon-seeds, mashed and fermented melon-seeds, a mashed pebble, some wild flowers, a broken clam shell. The ingredients are to be boiled together in a large quantity of water and drunk at one draught. Cicada shells is the great nervous sedative in China. Why the "sounding-board" of the scissors grinder (cicada) should be chosen is difficult to understand. In one respect, however, the Chinese concoction forms a pleasant contrast to European quack remedies, as it contains absolutely nothing that could possibly do any harm to the patient, and if there be any sound basis for hydropathy, the large quantity of water swallowed might possibly be beneficial.

THE Bombay Sanitary report shows a very heavy infantile mortality in the Presidency, 220 children *per mille* dying in their first year, while in the cities of Bombay and Ahmadabad the recorded figures give an infant mortality of 800 *per mille*, more than half the children born dying before they are a year old. The figures may not be particularly accurate, as registration in India is still very defective, but it is unlikely that more exact information would notably affect the proportional results.

LUDHIANA, an important city in the Punjab, is to have a modern water supply, and pipes, &c., to the amount of nearly £7,000 have been ordered from England.

ALTHOUGH diminishing somewhat in the native city, plague is increasing seriously in the cantonment of Poona, dead squirrels and rats having been found in nearly every house. An exceptional feature of the outbreak is the number of Europeans that have been attacked. The goods station master and his entire family have died and an officer of the Railway Survey Department has also fallen a victim to the disease. The deceased, it appears, picked up a squirrel which he erroneously thought to be dead, when the little animal turned round and bit him, with the result that within forty-eight hours he was removed to hospital in a dangerous condition. Government has sanctioned the expenditure of Rs. 500 on the purchase of Roux's serum, and Mr. Jacob Sassoon has given Rs. 1,000 for the same purpose.

AT the instance of the Sanitary Commissioner the Government of India have instituted a modified examination for promotion for native assistant surgeons employed in the Sanitary Department, special papers on hygiene, elementary bacteriology, &c., being substituted for those on surgery and midwifery. In the case of an assistant surgeon so employed, however, reverting to the ordinary line he will be expected to pass subsequently in the subjects excluded from the special examination. This may be considered the first step towards the formation of a specialist corps of medical subordinates, and is undoubtedly a most useful and promising innovation.

A MAN sleeping under a tree on the Calcutta Maidan, was attacked by hornets and so badly stung that he had to be removed to the College Hospital, where he died in a state of collapse half an hour after admission.

THE current number of the *British Medical Journal* includes a memorandum by Captain R. Markham Turner, I.M.S., of his discovery of the presence of a tsetse-fly in Arabia. The specimen has been identified by Mr. Newstead, of the Liverpool School of Tropical Medicine, as *Glossina tachinoides*, West-

wood. In view of the constant intercourse between Arabia and the African coast, the danger of the spread of sleeping sickness to the Asiatic continent is only too obvious, in view of this discovery.

Personal Notes.

INDIAN MEDICAL SERVICES.

Arrivals Reported in London.—None.

Extensions of Leave.—Lieutenant-Colonel A. Milne, 12 m. furlough; Major W. D. Sutherland, study leave, August 6th to October 10th, 1906; Major J. Chaylor White, 1 m. medical certificate; Captain F. A. Smith, study leave, September 1st to September 30th, 1906; Captain L. P. Stephen, 2 days.

Permitted to Return to Duty.—Captain N. R. J. Ranier, Major J. Chaytor White, Captain R. E. Lloyd, Lieutenant-Colonel A. C. Younan, Captain L. P. Stephen, Lieutenant G. F. T. Harkness.

Postings.

Captain R. F. Baird officiates as Deputy Sanitary Commissioner, 1st Circle, United Provinces.

Captain E. S. Morgan, on return from leave to be Civil Surgeon, Etawah.

Captain O. Dykes officiates as Civil Surgeon, Jaunpur.

Captain Melville to be Professor of Materia Medica, Lahore Medical College.

Captain M. Mackelvie and E. H. B. Stanley, services lent to Civil Department, Bengal.

Captain J. W. Little, Civil Surgeon, Wano, is transferred to Gwalior as Residency Surgeon, his place being taken by Captain J. R. Tyrrell, now on famine duty in Rajputana.

Major M. H. W. Hayward, services placed at disposal Government of Bengal.

Lieutenant-Colonel J. Sykes, Civil Surgeon, on return from leave, to Bareilly.

Lieutenant-Colonel J. Jarratt, Civil Surgeon, on return from leave, to Fyzabad.

Major H. Austen-Smith, Civil Surgeon, on return from leave, to Bahraich.

Captain W. B. Turnbull, Officiating Civil Surgeon on return from leave, to Banda.

Major W. Selby, Civil Surgeon, from Bareilly to Sitapur.

Major C. Milne, Civil Surgeon, from Fyzabad to Gonda.

Civil Surgeon Man Mohan Das, on being relieved, from Bahraich to Hamirpur.

Military Assistant Surgeon W. J. A. Hogan, Civil Surgeon, on being relieved, from Banda to Pilibhit.

Lieutenant-Colonel J. A. Cunningham to be Civil Surgeon, Umballa.

Leave.

Major Melville, furlough for 1 year.

Captain V. G. N. Stokes, combined leave for 1 year.

Retirements.

Honorary Captain C. Gill, I.S.M.D.

R.A.M.C.

Lieutenant-Colonel A. E. Morris to Command Station Hospital, Jubbulpur; Major F. R. Buswell, to that of Jubbulpur; Captain F. Kiddle to that of Abu; Captain A. R. O'Flaherty to that of Sangor; and Captain D. O. Hyde to that of Khandalla; Lieutenant-Colonel H. A. Haines officiates in command, Station Hospital, Umballa; Lieutenant-Colonel T. P. Woodhouse officiates as P.M.O., Lahore division.

"Medizinische Blätter," No. 10, 1906.

ANKYLOSTOMES AN ETIOLOGICAL FACTOR IN MALARIA.

Sehrwald, of Brazil, states that he finds in persons suffering from malaria and infected by *Ankylostomum duodenale* that these worms contain the malarial parasite in their intestine and in the mucous glands of the ankylostome's mouth. Sehrwald is of opinion that these parasites may directly reinfect man, and may transmit malaria by means of eggs or larvæ. It is necessary in such cases to cause the expulsion of the worms before treating the anæmia present in all patients thus afflicted.

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Annual Report of Government Veterinary Bacteriologist," Pretoria, 1906, p. 110.

"BLUETONGUE" IN SHEEP.

Theiler, A. The disease may be met with throughout the Transvaal in marshy localities and along the river banks, and is especially rife in the autumn, *i.e.*, in the rainy season, and it is very probable that, like "horse sickness," it may be conveyed by a nocturnal biting insect. As the blood of the sheep that have suffered from the malady ceases to be virulent after recovery, it may be supposed that during the dry season the virus is preserved either in the intermediate host, or in the body of some vertebrate other than the sheep, possibly aquatic.

The virus contained in the blood or serum, if well diluted with physiological water, passes through a Berkefeld filter. The dried blood dissolved in physiological water, and inoculated, produces, after the usual period of incubation, a characteristic febrile reaction, and it is possible that this may be made the basis of a plan of vaccination.

The immunity conferred by a single inoculation is, however, somewhat feeble, and further inoculations of increasing doses are usually followed by the symptoms of bluetongue and sometimes by death. Sometimes, however, immunity is acquired after a second inoculation of blood, as was also found by Spreull, and Theiler further confirms that observer's statement, that sheep which have passed through the disease, and have afterwards been injected with 500 cc. of virulent blood, yield a serum which possesses preventive properties, 5 to 10 cc. of such serum suffice to protect, but do not cause any obvious reaction.

"Bulletin de l'Académie de Médecine," Paris, Year lxx., Nos. 8, 9.

ANTI-DYSENTERIC SERUM.

Vaillard, L., and Dopter, C., immunised horses by inoculation on alternate weeks with progressive doses of living bacilli and of soluble toxin. The toxin is obtained by filtering through porcelain a culture of dysenteric bacillus in Martin bouillon kept for twenty days at a temperature of 37° C. of ninety-six patients treated by hypodermic injections, and later by injections into veins; all recovered except one. Of the patients thus treated, all had been subjected to the usual dysenteric remedies unsuccessfully. As soon as the serum treated was employed, the patients' condition altered for the better, and recovery was established in from two to six days, according to severity of illness. No untoward symptoms are reported from the serum treated. The minimum dose employed was 20 cc. hypodermically given and repeated once or twice in the severer cases.

Notices to Correspondents.

1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the JOURNAL OF TROPICAL MEDICINE should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

Original Communication.

HUMAN SPIRILLOSIS IN LOANDA (ANGOLA).

By A. de S. Maia Leitao, M.D. (Oporto).

Captain Portuguese Colonial Medical Service; formerly at London School of Tropical Medicine.

(Preliminary Note.)

(Translated by the author from the note sent to the "Archivos de Hygiene e Pathologia Exoticas," of Lisbon.)

On July 24th, 1906, on examining the blood of a black soldier, native of Golungo, aged 24, who has been in service in Loanda some time, I found spirilla like those of Obermeieri [1].

The blood of the patient was examined by the writer at the request of Clinical Assistant Dr. G. Vicira, of the "Hospital Maria Pia," of Loanda, who suspected trypanosomiasis.

The blood films were stained by Leishman's stain, and examined by the $\frac{1}{12}$ oil immersion lens, when they showed the spirilla referred to.

It is the first time, to my knowledge, that this disease has been found in Loanda, and I therefore hasten to communicate the fact, although I have deferred making it public for some time, hoping to find other cases of the disease and also to find the tick [2] — *Ornithodoros moubata* — which is reported to be present in Loanda, but I have failed to find it up to the present.

I am also looking for the enemy of this tick—the *reduviidius* of F. C. Wellman, M.D., which was classified by E. E. Austen as *Phonergates bicoloripes*, Stål [3].

When the patient entered the hospital he was in the last stages of the disease, so that only the first blood examination was positive, and owing to the subsequent examinations being negative I could not make inoculations of animals.

Later the embryos of *Filaria perstans* were found in the blood of the same patient. As soon as further opportunity affords I will endeavour to ascertain whether this spirillum is *Spirillum Obermeieri* or *S. Duttoni*, or whether it differs in any way from these two. For this purpose I shall adopt pretty closely the views of Frederick G. Novy and R. E. Knapp [4].

References.

[1] I have sent blood films to the London and Lisbon Schools of Tropical Medicine to be verified.

[2] The Portuguese name is "Carrapato" not "Garrapato," as Sir Patrick Manson has it in his "Tropical Diseases," p. 714, 3rd edition, 1903.

[3] *Journal of Tropical Medicine*, 1906, p. 113.

[4] Studies on *Spirillum Obermeieri* and related organisms analysed in *Bulletin de l'Institut Pasteur de Paris*, 1906, p. 612, t. ix.

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2.—All **literary communications** should be addressed **to the Editors.**

3.—All **business communications** and **payments,** either for subscriptions or advertisements, should be sent **to the Publishers** of the Journal of Tropical Medicine. Cheques to be crossed The Union Bank of London, Ltd.

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Contributors of Original Articles will be supplied free with six copies of the Journal if a request accompany the MS. If reprints are required they will be supplied by the publishers, if the order is given with remittance when sending the MS. The price will be as below:—

50	Copies of four pages,		5/-;
100	,,	,,	6/-;
200	,,	,,	7/6;
50	Copies beyond four up to eight pages,		8/6;
100	,,	,,	11/-;
200	,,	,,	14/6.

One page of the Journal equals 3 pp. of the reprint.

If a printed cover is desired the extra cost will be for 50 Copies, 5/6; 100 Copies, 6/6; 200 Copies, 7/6.

THE

Journal of Tropical Medicine

December 1, 1906.

THE AFRICAN POISON TEST.

Dr. F. C. Wellman, in an article published under the *imprimata* of the American Society of Tropical Medicine, gives an interesting account of the African poison test as observed in the Portuguese colony of Angola, West Africa. The test by poison is employed as a means of settling disputes in many parts of Africa, and from time to time we have accounts which give so varied statements of the method, ritual, and drugs employed that many untravelled people regard the reports as mere travellers' tales.

Dr. Wellman's account is taken from observations amongst the Umbundu-speaking Bantus in the province of Angola, and he describes the poison test as it is practised amongst these people. Ombulungu is the local name for the ordeal, which, however, has different names in different parts of Africa.

The custom of administering justice by the poison test is of ancient origin, but has come down to the present day with an accumulation of ritual and ceremonial which tend to obscure the rational and elevate the mythical phase of the proceeding. The poison test is appealed to on occasions of disputes of several kinds, and withal so frequently that, according to Dr. Wellman, it is "a custom which has nearly depopulated whole districts, and has been responsible

for more deaths in Africa than have many important diseases."

The disputes which occasion resort to the poison test are: Hereditary disputes—family or clan feuds in fact; cases of murder when there is doubt as to the culprit; cases of adultery, and cases of alleged killing by witchcraft. In addition to these causes of quarrel, acts of thieving, be it of stolen property, slaves, wives, or cattle, after settlement by divination in presence of a witch doctor is impossible, the aggrieved party challenges his antagonist to trial by poison. To refuse the challenge is equivalent to a confession of guilt. When the quarrel reaches this point a witch doctor acceptable to both parties in the quarrel is decided upon, and with him lies the duty of preparing the poison. To the witch doctor each party to the quarrel, accompanied by friends and relatives, proceeds, and after preliminary speeches by the combatants, in which each loudly asserts his innocence, the poison is given them to drink. After drinking, a native dance takes place, and whichever man first falls down is held to be the guilty party. His friends then carry him away to die or recover, according to the strength of the poison given him.

There seems a certain rude justice in this account of the poison test, but when we come to look below the surface we find that, the witch doctor not being above bribery, it is usually the litigant with the longest purse that wins. "Refreshers" in the form of presents serve to bribe the judge, and to warp his mind so that his decision is settled beforehand, and the method and manner of administering the poison draught is tampered with accordingly.

Dr. Wellman points out some of the tricks by which the witch doctor adjusts the draught in accordance with his preconceived conclusions as to which of the litigants is to die. One plan is to fill two drinking vessels (*gourds*) with apparently similar ingredients, one for each of the disputants; but although to all appearances identical, one of the vessels, that intended for the unfortunate man whom it is meant to condemn, contains a potent poison. Another plan is, however, more subtle; one *gourd* only is used, the favoured individual is given the first half of the draught to drink, his opponent the latter half. After the former has finished his draught, however, the contents of the vessel are stirred, whereby the actual poison, which hitherto lay at the bottom, is mixed with the fluid, when the second man receives the full benefit of the lethal substance. Several other methods of trickery are practised by the witch doctor, such as enclosing the poison in a resinous substance placed at the bottom of the vessel, which can be liberated when desired by scratching the resinous enclosure with the nail of the finger when stirring the decoction. Instead of this, a skin bag with two compartments, one containing a poisonous, the other an innocuous, powder of similar colour is employed, and the contents of either bag dusted in the fluid into the *gourd* as desired.

Dr. Wellman gives the plants from which the substances used in the poison test are obtained in various parts of Africa with his customary accuracy of detail. Of these he mentioned *Strychnos icaja* (Baill.); *Physostigma venosum* (Balf.); *Erythroplæum judicale* (Proct.); *Tanghinia venenifera* (Poir.); *Allenium somalense* (Poir.); and *Menabea venenata* (Baill.).

Amongst the Umbundus, however, none of the above were used, but instead *Erythroplæum* (*E. guineense*) (Don.), with two other poisonous plants, namely, *Securidaca longipedunculata* (Fres.) — the Utica bush, and more rarely *Tephrosia vogelii* (Hook, *fil*).

The effect of the mixture used in the poison test by the Umbundus is, in the first onset of symptoms, vomiting and purging. This is followed later by loss of power in the limbs, and the victim falls to the ground and dies speedily and quietly. The administration of the test occasionally fails owing to the witch doctor's inefficient steps in mixing or disguising the poison, when both disputants may die from the effects of the draught.

THE ORGANISATION OF THE MEDICAL SERVICE OF THE NATIVE ARMY OF INDIA.

The organisation of the military section of Indian Medical Service has during the last few weeks formed the subject of two leading articles in an influential Indian contemporary, the *Pioneer*, and as that journal usually keeps itself well in touch with the official hierarchy of Simla, it may be taken as tolerably certain that the subject would not receive such marked attention in its columns unless changes of organisation were under consideration.

The present system, it may be admitted, is somewhat archaic, being simply the old and somewhat discredited "regimental system," but it by no means follows that it is therefore unsuited to the Indian Army, as it must be remembered that Indian civilisation is also very archaic, and although the sepoy is armed and drilled on the most approved modern European models, he remains in his social and domestic life a very archaic person. Soldiers' institutes and sergeants' messes, athletic clubs, and so forth, have, for example, become absolute necessities of life for the British soldier, but they would be impossible and useless in the native army; and the same differences of habits that make our European organisation of the social side of military life unsuited to native troops, deprives the station hospital system of most of its advantages when applied to them. Perhaps the most striking advantage that can be claimed for the station hospital system is the greater efficiency and economy of dieting arrangements, but owing to caste prejudices nothing of the kind can be attempted on behalf of the native, as some castes are so exclusive as to object to take food even if prepared by a Brahman of the highest standing. It is extremely difficult to convey to the uninitiated the difficulties that meet the European physician at every point of the dieting and nursing of native patients, and as our native regiments are almost universally recruited from men of the best and most exclusive castes, a vast amount of tact and an intimate knowledge of caste custom are essential to the medical officer of a native corps to enable him to exercise his profession with success. Moreover, the subdivisions of caste are so

intricate, and the tendency to fission within the caste is so strong, that it by no means follows that one can prudently act in the case of the 100th Dogras in the same way as one might in the 101st of the same caste. The redeeming point of the old regimental system in the British service was the personal knowledge of his patients acquired by the regimental medical officer, a most valuable asset to any physician, but the importance of such knowledge for him is but trivial as compared with its indispensable character in the case of native troops.

The weakness of the regimental system lies, of course, in its inapplicability to modern conditions of active service.

The *Pioneer*, it must be remembered, unlike our European lay journals, appeals mainly to an official public, and to a great extent may be said to be written by experts for experts, and it may be well, therefore, to consider seriously the line of argument taken by it, and the proposals it has to make for improvement.

It takes as its text an excellent remark of Colonel P. S. Maitland, in a paper on Army Re-organisation, read before the United Service Institution of India in 1890, which runs as follows:—

"There is one condition that is universally recognised in the organisation of the army of every State which has any pretensions to rank as a military Power, and also in some which have no pretensions at all. It is, I think, not too much to say that this condition exists in every army whose efficiency is of vital importance to its country, and it may therefore be regarded as an essential factor in producing that efficiency. This condition is that the war organisation of an army is precisely the same as the peace organisation. What I mean to say is that the army corps, divisions, brigades of an army with their staffs, trains and subsidiary organisations, exist in peace as they do in the field."

Judged by this indisputable test, it is at once seen that the station hospital plan stands under even deeper condemnation than the regimental system, for while the latter serves very well for short operations in which only small numbers of troops are employed, such as the counter raids on the frontier that are unfortunately so often unavoidable in India; the station hospital system has to be replaced on service by an elaborate system of field hospitals, in the working of which the officer has had no practice whatever during peace.

With the scathing condemnation of the station hospital system indulged in by our contemporary we have little sympathy, for while we equally regard the plan as a bad one in principle, we know that the skill and devotion of the officers of the R.A.M.C. have made it, practically speaking, extremely efficient for all that it is fit for—the necessities, to wit, of peace time. What we regard as its most striking defect is the lack of opportunities of exercising responsibility for the junior officer, as the latter is little more than a sort of superior clinical clerk to the senior medical officer, and so acquires practically no experience of the responsibilities of charge until, after long years, he has them thrown by seniority on his quite unaccustomed shoulders.

The regimental system, however, has this marked advantage, that the habit and practice of responsible charge is thrown on the medical officer from almost the very outset of his service, and it is probably owing to this, more than to any other cause, that in spite of its admitted defects, our Indian medical military organisation has always "worried through" without an actual breakdown.

The *Pioneer*, therefore, proposes to retain the regimental system, but to institute an addition—a system of field and general hospitals, attached—which is most important—not to stations but to brigades. The regimental officer would attend to the sanitary necessities of his corps and provide for its military surgical arrangements as a unit in action, and would attend to the trivial cases in peace time, passing on the more serious cases to the field or general hospital just as he would in war, but the officers of the latter would form an integral part of the Brigade to which they belonged, and so would retain the personal touch with their patients, so essential in dealing with native troops.

It is obvious that when the regimental work in peace time was too light to occupy the entire time of an officer, his services might be utilised to some extent in the larger hospital by giving him a ward, for the *medical* treatment within which he should be solely responsible, and also that under such a plan all that would be required on a Brigade taking the field would be, as our contemporary remarks, not "alteration, but expansion," by the strengthening of the field hospitals by additions to their staffs, as it is obvious that on active service the regimental surgeon, forming as he would this first line of medical aid, could not be made in any way available for assistance in the second and third lines. Space forbids our entering into the details of the plan as outlined by our contemporary, but there is undoubtedly much to be said in its favour, and we therefore trust that the article referred to may really be taken as a shadow forecast by the events that are being worked towards by the responsible authorities.

It is obvious, however, that, like most changes tending to increase efficiency, the plan so ably advocated by the *Pioneer* involves a considerable increased expenditure. The regimental medical officer remains as such, and a considerable addition must be made to the nominal roll of the service, to afford at least the nucleus of a *personnel* for the field and general hospitals. The station hospital plan, on the other hand, though nasty, is cheap; cheaper even, perhaps, than the regimental system, though the latter is extremely inexpensive as worked in the native army, where practically one commissioned officer and two or three subordinates (hospital assistants and compounders) for each battalion, with a few odd men thrown in for staff and detachment work, form the entire *personnel*. This proportion of medical aid to fighting men is, of course, far smaller than that subsisting in the British Army under the station hospital plan, and it is extremely doubtful if even in the native army the latter could be worked with a smaller personnel than that now employed, under the regimental system.

It must be remembered that the Indian Medical Service enjoys an advantage possessed by no other military medical organisation in the shape of a reserve

of trained military surgeons much stronger in number than those actually employed with the troops.

This reserve is the Civil Branch. When war breaks out the civil surgeons hand over their duties to their native assistant surgeons, who are fully qualified practitioners, and at once proceed to the front, when in practice they officer the field and general hospitals, the regimental officers naturally and justly claiming the more attractive share of the work in accompanying the fighting line. Having all passed through a more or less prolonged period of military work and being habituated to constant and onerous administrative responsibility, they fall naturally and easily into their places, and the practical outcome of the present system is very much the same as the theoretically more ideal system advocated by the *Pioneer*.

During the Tirah Campaign, for example, something like a third of the civil surgeons in the United Provinces were withdrawn for service in the field. And really all that is wanted to secure smooth working is occasional mobilisation operations in time of peace; so that whenever manœuvres were conducted within their Province, the civil surgeons might occasionally enjoy the opportunity of mobilising their field hospitals, the materials of which might be stored at provincial capitals under the charge of the regimental officers stationed there. Failing, therefore, the funds to carry into effect the more ideal system advocated by the *Pioneer*, why not leave things alone?

EXPERIMENTS IN PRACTICAL CULICIDAL FUMIGATION.

Arthur I. Kendall, Ph.D., of the Board of Health Laboratory, Panama, states that one of the most important sanitary problems associated with the digging of the Panama Canal is the suppression of mosquito-borne diseases. The destruction of mosquitoes is accomplished in several ways, but Mr. Kendall deals only with fumigation.

Methods of Procedure.

(1) Preparation of the house: Disturb the apartments as little as possible; stop up all openings; have the door guarded by a canvas curtain.

(2) To fumigate: For each 1,000 cubic feet of air space, 2 lbs. of sulphur, or 2 lbs. to 4 lbs. pyrethrum, are placed in a pot and set alight.

(3) After a few hours the house is opened up, the mosquitoes swept up with a damp broom, the paper and paste used in stopping up cracks removed. Of the several fumigants, sulphur is the most convenient for use. Pyrethrum, also known under the names of "Bubach," Persian insect powder and Dalmatian powder, is used, but the powder should be that obtained from unexpanded flowers, and not the adulterated varieties frequently offered for sale.

Campho-phenique, called also Mimm's mixture, consists of a mixture of equal weights of camphor and (95 per cent.) carbolic acid, and has proved a fairly reliable culicide. Four ounces of the mixture is placed on shallow pans for each 1,000 cubic feet of air space, and subjected to the heat of an alcohol lamp.

Of the three fumigants mentioned, campho-phenique has the advantage of being cheap, efficient and non-objectionable. Sulphur is efficient but proves injurious to fittings and fabrics. Pyrethrum is unreliable and causes darkening of light-coloured paint and similar substances.

Several other fumigants have been experimented with. Concerning these it is stated: Hydrocyanic acid is dangerous to human beings, owing to its poisonous fumes; chlorine gas has the disadvantage of bleeching fabrics; carbon disulphide is dangerous owing to its inflammability; Jimson weed or stramonium is unreliable; formaldehyde is an unsatisfactory insecticide, although so potent a bactericide.

JUVENILE SMOKING.

It is said that we are without information as to the effects of smoking upon native children in warm climates. Our correspondents might help the enquiry now being conducted by a Select Committee of the House of Lords, which is at present engaged upon the Juvenile Smoking Bill, by giving their opinions. We do not ask for scientific proofs concerning the effects of smoking on native children, that is well-nigh impossible, but although definite proofs may be wanting, observations on the subject may be of value.

The points we suggest for enquiry and reply are:—

(1) Do the children of natives in warm climates commence to smoke at a very early age, and, if so, state approximately at what age?

(2) Are deleterious effects observable?

(3) What is the form in which tobacco is used?

(4) Do parents in the Tropics discourage the use of tobacco by their children?

(5) Are parents of opinion that juvenile smoking is deleterious, if so, in what way?

(6) Is tobacco supposed to have any beneficial action in the prevention of disease?

Answers to these questions, forwarded to the Editors, will be submitted to the Select Committee of the House of Lords.

PRECISE DEFINITION OF DISEASES.

Dr. James F. Leys, Surgeon United States Navy, in an article which appeared in the *Medical Record* of June 10th, 1906, draws attention to the nature of the definitions customary in medical text-books. He objects, and rightly, too, to the use of *a* or *an* in defining specific diseases, and cites as an example a so-called definition of anthrax commencing, "Anthrax is *an* acute," &c. Leys would employ the following formula for a disease of which the cause is known: Anthrax is "*the* disease caused by an invasion of *Bacillus anthracis*." In the same way actinomycosis is *the* disease caused by an invasion of *Actinomyces bovis*. Similarly may be defined tuberculosis, diph-

theria, malaria, and so on through all the diseases the cause of which is known. It is to be hoped Dr. Ley's advice will be taken, and so-called definitions, which are more in the nature of short descriptions, at present in use be dropped.

ANTI-MALARIAL CAMPAIGN IN AUSTRIA AND HUNGARY.

THE Austrian Government has during the past two years been conducting an anti-malarial campaign along the Adriatic coast with marked success. It is from this region that the majority of sailors for the fleet are recruited, and the prevalence of malaria amongst the inhabitants of the coast has proved a serious detriment to the health of the navy. The means taken to eradicate the disease is by draining swampy grounds, oiling collections of water, and the distribution of quinine. The success of these measures has been proved by the fact that during the past two years the number of fresh cases of malaria declined 62 per cent. The Governor of Dalmatia has instituted similar prophylactic measures in his province with encouraging success. In Hungary, the part played by the mosquito in the spread of malaria is being taught, and in many districts stringent measures are being prosecuted to exterminate the Anopheles.

Reports.

MEDICAL OFFICERS OF MISSIONARY SOCIETIES' ASSOCIATION.

AT meetings of this Society held in May and October, Mr. McAdam Eccles introduced the subject of "The Surgical Aspect of the Missionary Candidate"; he dealt with the various systems *seriatim*, the following being an epitome:—

RESPIRATORY SYSTEM.

Allusions were made to deflected septum of the nose and to nasal polypi, and to *adenoids* and their consequences. He said that many a missionary candidate had poor physique owing to the results of adenoids, and to a town life, particularly when their occupation had been that of clerk or shop-woman. It was important to see that there was no defect of the larynx, as a clear voice was of much importance in the preacher.

ALIMENTARY SYSTEM.

With regard to the question of teeth, the first fact of importance was whether the loss of a certain number of teeth negatived the going abroad of the candidate. Mr. Eccles thought not, but that the question of how the teeth met, in other words, their usefulness, was the real issue. Artificial teeth were essential for those who had lost a number of teeth, but they must be good, simple, worn for some time previous to leaving England, and two sets should be taken out.

Should a *hernia* disqualify? Mr. Eccles answered this in the positive. A radical operation should be performed at least six months before going out. Femoral herniæ, and particularly those in men, were more dangerous than inguinal, and possibly umbilical even more than femoral.

What should be the course adopted with regard to *appendicitis?* He was emphatic that if there has been one attack of a definite nature, operation was imperative before the candidate could be allowed to proceed abroad.

VASCULAR SYSTEM.

Varicose veins, should they be always a bar to service? No, it depends upon the variety of varicosity. There are really three forms of varicose veins, one the single enlarged vein, due probably to a congenital defect, and one easily cured by operation; the second, the congestive form, in which there are a number of small superficial veins enlarged, these give rise to much trouble and are difficult to cure by operation, and probably it is best to reject the candidate who is the possessor of them; the third form, due to obstruction by pressure within the abdomen, means, as a rule, that there is trouble which necessitates rejection, unless the pressure can be satisfactorily removed, and that permanently.

Varicocele.—Here, again, each case has to be taken on its merits. Slight enlargement of the spermatic veins, especially if there have been no symptoms arising therefrom, need not be dealt with surgically, and it is important not to draw the candidate's attention to them, if he does not complain of them. On the other hand, if there has been trouble from these varicose veins, it may be that this very fact is an indication that the person is not a suitable one to stand the wear and tear of a life in tropical climes.

Hæmorrhoids.—These should always be operated upon, on account of the increased liability to constipation on foreign service. Also returned missionaries who have been subject to hæmorrhoids should be strongly advised to have them treated surgically.

LYMPHATIC SYSTEM.

Enlarged Glands.—These often mean that the candidate has had poor physique, and scars in the neck should always mean a careful examination. It has been suggested that tuberculous glands in early life tend to render the person immune to tubercle in later years; this may be so, but there is often an inherent weakness in persons who have been the subject of tuberculous glands.

Enlarged Thyroid Gland.—This is not necessarily a bar to work in the foreign field, but great care should be taken to exclude the candidate should the enlargement be the indication of early exophthalmic goitre.

LOCOMOTORY SYSTEM.

There are a large number of conditions of the feet which, although apparently small in themselves, are of great importance from the point of view of the missionary candidate.

Flat-foot.—Any tendency to flat feet, particularly in women, should be looked upon with suspicion, often indicating general want of tone.

"*In-growing Toe-nail.*"—It is well to bear in mind that this condition is very common, and that it is not due to the "in-growing" of the nail, but to the over-pushing of the soft parts. The treatment of the lesion is not to remove the great-toe-nail, but to push back the soft parts, and to see that a proper boot is worn.

Hammer-Toe. — This condition may cause most troublesome lameness, and should be treated surgically before a candidate is accepted.

Hallux Valgus. — The same applies to this deformity.

Diseases of Joints.—There are several lesions of joints which naturally interfere with locomotion, and may be of hindrance to the missionary. They may necessitate the refusal of the candidate. Loose bodies and loose cartilages should be treated by operation before the possessor proceeds abroad.

Paralysis, including Infantile Paralysis.—It is probably best to refuse a candidate who is the subject of paralysis of any kind.

Deformities.—Any marked deformity is a contra-indication to acceptance.

Special Senses.

Eyes.—The importance of eye symptoms cannot be over-rated. Headaches, mental strain, and other conditions are often due to eye lesions, and any tendency to these should lead to a careful examination of the eyes. If it is necessary for spectacles to be worn, they should be fitted and tested some months before the missionary goes abroad, and a spare duplicate instrument should always be taken out.

Ears.—Otitis media, if present, should always disqualify, and any great degree of deafness would also do the same.

Discussion was adjourned till the Association's meeting on October 30th, when, amongst others, the following members took part: Colonel Hendley, I.M.S., Mrs. Scharlieb, M.D., Drs. MacDonald, Harford, Soltau, Fox, and Price. Discussion centred chiefly round the questions whether with an indefinite history of an attack of appendicitis an operation should be performed? Whether the operation, having been successful, the individual was by the nature of the disease predisposed to enteric infection? Cases being quoted to support such an hypothesis.

The question of enlarged glands, which had suppurated earlier in life, leaving behind merely scars, proved also of interest, particularly with regard to the problem whether in such cases there was immunity from tubercle conferred, or whether such individual under the stress and strain of life abroad showed an increased incidence of tuberculous disease.

The condition of movable kidney in the candidate was also brought forward.

THE SOUTH AFRICAN MEDICAL CONGRESS.

On October 1st, 1906, the South African Medical Congress was opened at Bloemfontein, Orange River Colony. Some seventy medical men from widely separated parts of South Africa were present. The Hon. F. Wilson, C.M.G., acting Lieutenant-Governor of the Orange River Colony, opened the Congress, and in the course of his speech dealt with the various laws affecting medical men and the public health. The President of the Congress, A. E. W. Ramsbottom, M.D., of Bloemfontein, in his opening address, strongly advocated unity amongst medical men in South Africa.

The President of the Section of Medicine, H. Aylmer Dumat, M.D.Edin., F.R.C.P.Edin., delivered an address entitled, "The Motive Powers of the Mind." G. Porter Mathew, M.D., opened the discussion on "The Treatment of Uterine Displacements." Drs. Klots, Murray, Mackenzie, Davies, Ashe, Gordon, Grant, and Knobel took part in the discussion.

G. Ritchie Thomson, M.B., C.M.Edin., F.R.S. Edin., read a paper entitled, "The Diagnosis and Treatment of Diseases of the Biliary Passages." Drs. Ashe, Davies, Knobel, Murray, and Richardson discussed the paper.

G. E. Murray, M.B., F.R.C.S., read a paper on "Fistulous Communications with the Urinary Tract."

J. B. Knobel, M.D., L.R.C.S.Edin., contributed a paper on "A Case of Obstinate Ulceration of the Dorsum of the Fingers and Dorsum of the Left Hand, probably due to Unilateral Raynaud's Disease."

His Excellency the Acting Governor of the Orange River Colony attended the Public Health Section of the Congress, and took part in the work of the Section.

Miscellaneous.

PIETRO JAMES MICHELLI, C.M.G.

(Secretary Seamen's Hospital, and London School of Tropical Medicine.)

The authorities of the London School of Tropical Medicine are well aware of their indebtedness to Mr. Michelli, upon whom His Majesty King Edward VII. recently bestowed the most honourable distinction of Companion of St. Michael and St. George. It may be safely said that the honour has never been bestowed upon one more worthy of the distinction. The London School of Tropical Medicine has been built up, launched, floated, and started upon its useful and successful mission under Mr. Michelli's capable and efficient pilotage; and it is to be hoped he may continue for many years to shape its course and stand by its helm.

It was to Mr. Michelli that Sir Patrick Manson, in 1897, first unfolded his scheme for imparting instruction in tropical medicine, and from that date until the present moment Mr. Michelli has taken a lively and enthusiastic interest in all that appertained to the success of the School.

The scheme once formulated was submitted to the Board of Management of the Seamen's Hospital Society. The members of the Board grasped the national importance of the proposal. The then Deputy

Chairman (now the Chairman of the Board), Mr. Perceval A. Nairne, entered heartily into the development of a school of the kind, and, loyally assisted by his colleagues, they resolved to finance the effort and aid the foundation of a School of Tropical Medicine at the Branch Hospital of the Seamen's Hospital Society, Albert Docks, London, E. The formation of a school for the study of tropical diseases was a peculiarly appropriate step for the Board of Management of this Hospital to take, for the patients in their wards were largely composed of sailors suffering from tropical ailments. Here was the material for study, and it only needed someone to initiate the idea, and to organise and finance the scheme to bring it to a practical issue.

The Colonial Office, under the stimulating lead of the Right Hon. Joseph Chamberlain, M.P. (at that time the Secretary of State for the Colonies), lent willing assistance, and contributed a sum of £3,550 towards the scheme.

Since then many liberal contributors have furthered the requirements of the School, and several of the Crown Colonies have contributed towards its maintenance and development.

Some £40,000 have been spent upon the School, yet it is satisfactory to know that the School is free of debt, and likely to continue so. In all the work of organisation Mr. Michelli has played an active and a prominent part, and we rejoice to think that his devoted services have been rewarded in a manner which reflects honour upon himself, and has given pleasure and satisfaction to all the members of the Board of the Seamen's Hospital Society, and to the staff of teachers at the London School of Tropical Medicine. We believe Mr. Michelli is the first secretary to a public hospital on whom an honour of the kind has been bestowed, and we take it that amongst the many able men who serve their hospitals in a like capacity, the decoration of Mr. Michelli will be regarded as a welcome recognition of how their efforts are regarded, not only by the King, but by the country generally.

Review.

ILLUSTRATED KEY TO THE CESTODE PARASITES OF MAN. By C. H. Wardell Stiles. Washington, 1906, pp. 104.

THIS small volume (Bulletin No. 25), issued by the Hygienic Laboratory of the Treasury Department, U.S.A., is an elaborate and carefully executed companion to the "Illustrated Key to the Trematode Parasites of Man" (Bulletin No. 17), issued by the same laboratory. Both these volumes deserve a better setting than has been given them. In their present form, however, they are eminently useful; the illustrations, mostly in diagramatic form, are excellent for teaching purposes, and the text will be found to be practical and easily followed.

Correspondence.

INTERNATIONAL CONGRESS FOR HYGIENE AND DEMOGRAPHY.

To the Editors of the JOURNAL OF TROPICAL MEDICINE.

DEAR SIRS,—I shall be very much obliged to you if you would have the kindness to publish the following notice in your Journal.

Yours faithfully,

Berlin, *November 14th*, 1906.

DR. NEITNER, *Secretary-General.*

THE FOURTEENTH INTERNATIONAL CONGRESS FOR HYGIENE AND DEMOGRAPHY.

Her Majesty the Empress of Germany has most graciously accorded her high protectorship to the work of the Fourteenth International Congress for Hygiene and Demography, which will take place in Berlin in September of next year.

TYPHUS AND SPOTTED FEVER.

To the Editors of the JOURNAL OF TROPICAL MEDICINE.

SIRS,—I see on p. 271 of your issue of September 1st, that the Mexican Government have offered three prizes of £4,000 each for discoveries connected with typhus, and that Dr. Terres, of Mexico, states that typhus is seldom met with below an altitude of about 2,000 feet. Is not this disease more probably the "Spotted Fever" of the Rocky Mountains? This fever has been known, since 1872, in some of the four neighbouring States of Nevada, Montana, Idaho, and Wyoming. It is often confused with typhus, because of the eruption which usually appears first on the wrists, ankles, and back, about the third day, and spreads rapidly over the rest of the body, lasting from eight to twenty-one days, or even longer; the spots are petechial, and sometimes coalesce, giving a mottled appearance to the skin. Among other symptoms resembling typhus there are injected conjunctivæ, photophobia, epistaxis, offensive breath, sordes on teeth, dry, brown tongue, and weak pulse. Hypostatic pneumonia is the most common complication; convalescence is slow, and there are many other minor resemblances to typhus. The American doctors who have studied the disease, and have taught us the little we know on the subject, are not usually very well acquainted with typhus, but they consider that the two diseases are distinct. Among symptoms which do not resemble typhus we hear of desquamation, jaundice, tenderness of the right iliac fossa, tympanitis, swollen joints, vomiting, enlarged liver and spleen. Mr. C. W. Stiles made a zoological investigation into the etiology of "Spotted Fever," in 1904, for the United States Government, and was unable to confirm the theories that the blood contained a piroplasma, or that it could be communicated by ticks to rabbits or other animals. His communication was published last year by the Hygienic Laboratory at Washington.

Yours truly,

Cavendish Square, London. F. M. SANDWITH, M.D.

Drugs and Remedies.

THE "TABLOID" BRAND.—We congratulate Messrs. Burroughs Wellcome and Co. on their successful defence of what would appear to have been an infringement of their rights to the exclusive use of

their designation for compressed drugs. A trading company wished to register the word "Tablones," to designate their products. This was refused by the Board of Trade and subsequently on appeal to the High Court of Justice. The several attempts to dethrone the magic word "Tabloid" has hitherto ended in deserved failure. There can be no doubt that words resembling "Tabloid," used by companies other than Burroughs Wellcome and Co., are only employed for one purpose. Surely we have enough originality left amongst us to devise catching names for new preparations, without seeking to come in conflict with existing terms.

The three following preparations are issued by Messrs. Martindale, 10, New Cavendish Street, London, W.:—

TYLMARIN, a new coumaric derivative. It has been commended for the treatment of tubercular glands, in conjunction with injection of the 22 per cent. solution of sodium-orthocoumarate and the glycerine solution of sodium cinnamate. The same drug is suggested as a treatment in malignant ailments.

SYRUPUS IODO-TANNICUS, is a palatable preparation containing iodide in loose chemical combination, and employed in the treatment of enlarged cervical glands.

SEDEFF contains suitable doses of opium, bismuth, and digestive ferments; it is useful in digestive derangements, especially those accompanied by vomiting, and in the sickness of pregnancy.

Books and Papers Received.

PROFESSOR GALLIO-VALERIO'S new work on the Mosquito is published by Edwin Frankfurth, 12, Grand Chene, Lausanne, Switzerland. The book is illustrated. Price 4.50 francs.

Notes and News.

LEPER COLONY IN THE PHILIPPINES.—A permanent leper colony has been established at Colion Island, in the Philippines. Some 200 lepers are now installed there. Four Roman Catholic Sisters have volunteered to nurse the lepers in the colony.

THE King of the Belgians has offered a prize of about £7,000 to any person, of any nationality, who shall discover a cure for sleeping sickness. A sum of about £10,000 is also offered by His Majesty for the purpose of making researches and experiments towards exterminating sleeping sickness.

R. KOCH is at present in Sese, Bugala, in Africa. The investigation of sleeping sickness is usurping the whole of his time.

ISTHMIAN CANAL COMMISSION.—From January 1st to August 31st, 1906, only one case of yellow fever was reported from the Canal Zone. During August, 1906, the mortality from the most prevalent diseases was as follows: Pneumonia, 94 deaths; malaria, 78; typhoid fever, 12; dysentery, 20; beri-beri, 5. The population of the part of the Isthmus from which these figures are obtained, numbers 75,000 people.

During September, 1906, pneumonia caused 86 deaths, and malaria 70. During the months of August and September, 1906, there were no fatal illnesses amongst the 4,800 Americans (whites) in the Canal Zone.

ACCORDING to our last news from India, the students of the Campbell (vernacular) Medical School of Calcutta had been out "on strike" for a week. According to the version of the affair as reported in the *Pioneer*, the cause of dissatisfaction in this particular case appears to be of a frivolous and personal character; but as the vernacular medical students have always shown themselves in the past as a very well-behaved set of young men, it may be taken that these recurring evidences of friction and discontent in these widely distant schools, are merely symptoms of a general feeling of dissatisfaction with the conditions prevailing in the service. It is to be hoped that the probably ill-advised turbulence of these boys will not prejudice Government against granting reasonable concessions in the matter of pay and prospects to this large and important service.

THE Punjab Government has before it a "Tenancy Bill," which includes some proposed enactments of medical interest. Clause 28 gives power to levy a tax to defray expenses connected with the sanitation and general administration of village sites. This should prove a very useful power, as apart from the theoretical position of the Government as the ultimate possessor of the soil, it deals directly as landlord to tenant in the case of the very extensive population of farm colonists, now settled on, till recently, waste lands, that have been reclaimed by irrigation.

Naturally enough, these chance collections of cultivators lack the power of cohesion and initiative of older villages, and the Government is in a far better position to make them models not only of cultivation, but of sanitation.

These newly irrigated lands are, as might be expected, extremely malarious, and for other reasons require special measures of sanitation.

An old village site can always be easily recognised by its elevation above the endless surrounding plains.

The Indian peasant is a bad hand at repairs, and often lets his mud-built homestead fall down when a little timely personal exertion might have kept it habitable for years to come.

The sun-dried bricks, of which the huts are built, are fabulously cheap, and cannot generally be so conveniently made on the site as on the banks of the nearest tank, so he does not clear away the site or utilise the old material, but roughly levels the heap and builds on the ruins, with the result, that in the course of the hundreds, and perhaps occasionally thousands of years, a site has been occupied, the

centre of it stands perhaps 50 or 60 feet above the general level of the ground. This elevation of the site is, of course, a valuable sanitary asset, but has the undesirable corollary of the environs of the site being honeycombed with irregular excavations holding dirty water throughout the greater part of the year. In the case of really old sites, the entire inhabited site is more or less surrounded and intersected with a miniature "lake district," the intricacies of which would puzzle an expert marine surveyor. The water they contain is for the most part indescribably foul, and one of the most urgent and insoluble of the problems of Indian sanitation is that of the betterment of the state of things that has resulted from the method of development of village sites above described.

Now the irrigation colonies just mentioned have only been started during the last few years, and it is most important that the Government, in its strong position as direct landlord, should step in and regulate the development of these new villages before the evils that have been touched upon have crystallised into established facts.

It is extremely desirable that the inhabited site hould be raised well above the general level of the rrigated fields, and it is also most important that the subsoil beneath it should be drained. Now both these objects can be attained by making deep and properly graded cuttings to the nearest practicable outfall, and utilising the spoil to raise the site, but such operations can only be undertaken by the Government itself, and the power to levy a small tax to cover the interest of the capital outlay will be a valuable one, which we trust Government will promptly utilise, and justify by works of sufficient magnitude to demonstrate that irrigation is not necessarily incompatible with a good standard of public health.

THERE is a want of uniformity in the attitude of the various provincial governments in India in the matter of dealing with the growing evil of the cocaine habit. No steps, for example, have been taken in the United Provinces of Agra and Oudh, to bring cocaine under the provisions of the Excise Acts, and the result is, it appears, that these provinces form centres from which smuggling can easily be conducted into neighbouring provinces where the authorities have acted more wisely in the matter.

THE current (November) number of the *Indian Medical Gazette* includes two useful "Notes" by members of the Calcutta Plague Staff.

In the first Captain V. B. Nesfield, I.M.S., strongly advocates the use of chlorinated lime as a disinfectant. He points out that owing to lack of penetrative and diffusive power, the metallic germicides, such as mercuric perchloride, cupric sulphate, &c., though extremely powerful when they can be brought into actual contact with bacteria, fail in practice on account of the impossibility of securing contact. A drop of a cultivation, for example, of *B. coli*, placed on a scrap of paper, and floated on some such disinfectant, remains quite unaffected for a long time. The chlorine gas, however, given off by chlorinated lime diffuses itself into chinks and crannies, and even permeates porous materials. The main objection to the agent is the difficulty of keeping it in good condition in a hot climate, and he therefore recommends that it should be sealed in glass tubes containing $2\frac{1}{2}$ oz. each, at a cost of $2\frac{1}{2}$d. each. Each of these tubes suffices to make eighty gallons of a germicide lotion.

Chlorine is, of course, an excellent insecticide, but we doubt if it would be given off in sufficient quantity from such a lotion in a sufficiently concentrated form, to secure the destruction of flies; as if it were so, its application would obviously be dangerous to the disinfecting gangs; and failing the power to destroy insects no germicide can be considered reliable in dealing with plague.

Chlorine can, however, be easily and cheaply manufactured, with a suitable apparatus, by pouring slightly diluted sulphuric acid on a mixture of common salt and binoxide of manganese, the whole of the chlorine contained in the salt being liberated.

There would be no difficulty whatever in contriving a suitable apparatus to contain a charge of the salt and dioxide, into which an appropriate charge of acid might be tipped by pressing a button. All openings but one having been closed in the room to be disinfected, all that would be necessary would be to place the apparatus within the room, press the button, and immediately leave the room, closing the door behind one, as if provided with a fairly long flexible tube, the gas would not begin to issue from it until ample time had been given to effect the small manipulation necessary.

The second note, from the pen of Dr. W. C. Hossack, deals with the species of rats found in Calcutta. He finds that the rats concerned are *Nesokia bengalensis*, or Indian mole rat, 60 per cent.; *Mus decumanus*, the short-tailed grey rat, 26 per cent.; *M. alexandrinus*, a local race of *M. rattus*, the European long-tailed "black rat," 14 per cent.; and *N. nemonvagus*, the lesser Bandicoot, which is rare.

If we remember rightly, Captain Glen Liston found the black rat relatively much commoner in Bombay, and, as he points out, that, owing to its habits, it is much more commonly concerned in carrying plague than the other species, its rarity in Calcutta may serve to explain the comparatively lightness of the incidence of plague in Calcutta from plague.

FEVER is becoming seriously prevalent in the frontier cantonments. A Peshawar correspondent writes: "The great topic of conversation at present is the tremendous prevalence of fever, and it seems likely that owing to it, the divisional manœuvres, which were timed to take place about November 27th, will have to be abandoned, some 20 or 40 per cent. of the garrison being affected. The type seems to have reverted to the Peshawar fever of some fifteen years ago, which, happily, has been dormant for some years, and greatly resembles cholera."

A Rawal Pindi correspondent writes: "Pindi is still suffering under a veritable wave of fever of a most virulent type, and labour of any sort is scarcely procurable. Large fields of crops in the vicinity of the town stand uncut, long since over-ripe, bearing silent

witness to the melancholy fact of the prevailing sickness."—*Pioneer Mail.*

It may be taken for granted that no adequate anti-malarial measures have been attempted in either of these stations. WHY NOT?

Personal Notes.

INDIAN MEDICAL SERVICES.

Arrivals reported in London.—Lieutenant-Colonel J. Smyth, Lieutenant W. F. Brayne, Lieutenant C. H. Barber.

Extensions of Leave.—Major W. Pilgrim, furlough to February 3, 1907; Lieutenant-Colonel R. H. Castor, one week furlough; Major J. T. Calvert, study leave, January 15th to July 14th, 1906; Captain D. N. Anderson, 6 m. medical certificate.

Permitted to return to Duty.—Captain A. Murphy.

Postings.

Major H. E. Drake Brockman, Residency Surgeon, Western Rajput States.

Lieutenant-Colonel P. D. Pank, Residency Surgeon, Jaipur.

Lieutenant-Colonel W. H. B. Robinson, Agency Surgeon, Bikanir.

Major A. L. Duke, Residency Surgeon, Bangalore.

Major T. W. Irvine, Senior Surgeon and Sanitary Commissioner, Mysore.

Lieutenant J. F. Boyd, to Civil Medical Duties, Kohat.

Lieutenant B. E. M. Newland, to Civil Medical Duties, Chitral.

Lieutenant-Colonel A. W. Dawson, to Civil Medical Duties, Roorkee.

Civil Assistant-Surgeon Purna Chandra Mukerji, to Civil Medical charge, Gonda district.

Lieutenant-Colonel S. H. Henderson, to be Superintendent, Central Jail, Agra.

Colonel H. Hendley resumes charge as Civil Surgeon, Lahore, and Professor Midwifery and Forensic Medicine.

Major E. V. Hugo, to Civil Surgeon, Lyallpur.

Major G. F. W. Ewens, resumes charge as Superintendent Punjab Lunatic Asylum.

Major P. J. Lumsden, to be Agency Surgeon, Bhopawar.

Major N. Burden, to be Agency Surgeon, Gilgit.

Captain McCarrisa, to be Agency Surgeon, Alwar.

Major Scott Montcrief, to be Agency Surgeon, Mewar.

Major J. Fisher, to be Agency Surgeon, Eastern Rajput States.

Lieutenant-Colonel A. M. Crofts, C.I.E., to be Administrative Medical Officer, N.W. Frontier Province.

Lieutenant-Colonel G. W. P. Dennys, to be Civil Surgeon, Peshawar.

Captain Fleming, to Consulate Medical Officer, Turbat-i-Haidari.

Captain L. J. M. Deas, to be Residency Surgeon, Gwalior.

Captain Macmillan, services at disposal Government Eastern Bengal.

Captain Munro, services at disposal Government Bengal.

The under-mentioned officers are permitted to continue in their appointments of specialists in prevention of disease: Major Julian, Peshawar; Major Taylor, Kamptee; Major Anderson, Meerut; Captain Spiller, Allahabad; Captain Smallman, Secunderabad; Captain Brunskill, Rangoon; Lieutenant Watson, Karachi.

The services of the following officers are placed at the disposal of the Government of India in the Home Department, with effect from October 16th, 1905:—

Lieutenant-Colonel R. N. Campbell, M.B.; Major D. R. Green, M.B., and Captains W. D. Hayward, S. Anderson, T. H. Delany, H. Inness, M.B., W. V. Coppinger, A. C. Gilchrist, and T. H. Watling.

Leave.

Major E. Jennings, 2 y. combined leave.

Captain H. Ainsworth, 7 m. combined leave.

R.A.M.C.

Lieutenant-Colonel T. B. Winter, to charge of Station Hospital, Bareilly; Captain W. Davis, to inspection of routes, in connection with Agra concentration; Major Mould, to Agra for duty; Captain J. F. Martin, from Northern Command to Poona Division; Lieutenant-Colonel G. Scott is granted six months' leave out of India.

COLONIAL MEDICAL SERVICE.

A. L. Hoops, M.D., D.Ph., State Surgeon and Superintendent of Prisons, Kedah, Malay Peninsula, has been appointed to act as Adviser to the State of Kedah during the absence on leave in Europe of Mr. G. C. Hart.

PECULIAR ERUPTIONS OF THE SKIN IN INDIA, DUE TO VEGETABLE AND INSECT LIFE, AND THEIR TREATMENT.

By Major G. H. FINK, I.M.S., M.R.C.S., L.S.A.Lond.

MOST people who have lived in India will have seen from time to time curious forms of skin eruption due to certain vegetable and insect life. These are peculiar to certain provinces and districts in India. Bengal and Assam produce some which are not to be seen in any other part of the country, and these very often are powerful in their action and produce vesication of the skin, burn, and create discomfort which resembles that of a strong blister or a hot iron applied to the skin.

In parts of Assam, such as the North Lushai Hills, one well-known leaf which is cordate in shape, bluish-green in colour, of the size of the hand, which grows in the jungles, possesses this powerful property of a vesicant if touched.

But the effects of a certain spider lick or bite is to be seen frequently in children in Bengal, when the face is generally the part affected, owing to this part of the body coming frequently into contact with spider webs. The result is often an eruption on the lips or chin, resembling *Herpes*, which, if untreated, goes on to resemble *Impetigo contagiosa*, if you compare these eruptions with it.

Treatment. — The most effectual treatment of a spider's lick or bite is as follows:—

Take a basin of cold water and let the patient hold his or her head over it. Now get a few lumps of mustard oil cake (which is to be had in almost every oilman's shop, since the cake is obtained after expressed mustard oil is manufactured, and is used largely to fatten cattle), burn these in a charcoal fire till of a black colour. Drop the burning lumps into the basin of water, and allow the smoke and fumes which rise to come into contact with the part of the patient's skin which is affected, twice a day, for two or three days. The result is a perfect cure.

On examining the surface of the basin full of water, there will be seen a large number of transparent little droplets of a yellowish-white colour, and about the size of a pin's head, which look like so many eggs of lepidopterous insects, or like the simple follicles of the secreting organs of the spider tribe (*Arachnida.*)

The study of Spiders, Scorpions and the Acarida, as well as the parasitic Acarida (to which *Demodex folliculorum* belongs) is very necessary, and it would be therefore essential to devote attention to such

insect and parasitic life, as well as the Lepidoptera, which create skin eruptions of a vesicular and follicular type, and to their proper treatment in the early stages, otherwise the character of the affection is masked by the lapse of time, and its origin very often lost.

MOSQUITO BRIEF PREPARED BY THE AMERICAN MOSQUITO EXTERMINATION SOCIETY.

(1) THERE are over 100 species of mosquitoes in the United States.

(2) Mosquitoes breed only in water. They may breed in any kind of quiet water unstocked with destroying fish.

(3) Mosquitoes generally require from one to three weeks to develop from eggs to winged insects in warm weather, longer in cold weather. Some female mosquitoes three days old lay eggs, the average is greater. Some species lay as many as three or four hundred eggs at once, some lay them singly. Mosquitoes may live several months (as shown by hibernation and otherwise), but probably few live over a month.

(4) Mosquitoes do not breed in grass, but rank growths of weeds or grass may conceal small breeding puddles, and form a favourite harbouring place for adults. The pitcher plant holds sufficient water to breed a rare and small species.

(5) Different species of mosquitoes have as well-defined habits as different kinds of birds, flies, &c. Some are domestic, some wild, some migratory.

(6) Most domestic mosquitoes breed in fresh water, fly short distances, and habitually enter houses.

(7) Most migratory mosquitoes breed in salt and brackish marsh areas, and can fly long distances. They are not conveyers of malaria.

(8) Rigid tests, both direct and eliminative, have proved that certain species of mosquitoes are the only known natural means of transmitting malaria and yellow fever. Some other diseases are known to be conveyed by mosquitoes.

(9) Of the domestic varieties, the dangerous malarial mosquitoes (several species of the genus *Anopheles*) are among the most generally distributed. They seem never to travel far, only a few hundred yards.

(10) A most common and dangerous domestic mosquito in the south and the Tropics is *Stegomyia fasciata*, which is the natural conveyer of yellow fever.

(11) Mosquitoes are known to bite more than once, as can be seen by observation, and is proved by the transmission of disease from an infected person to a new subject.

(12) Mosquitoes are a needless and dangerous pest. Their propagation can be largely prevented by such methods as drainage or filling of wet areas, removal, emptying or screening of water receptacles, spraying standing water with oil where other remedies are impracticable. Attention should be paid to cisterns, house-vases, cesspools, road basins, sewers, watering troughs, roof gutters, old tin cans, holes in trees, marshes, swamps and puddles. As malarial mosquitoes may be breed in clear springs, the edges of such places should be kept clean, and they should be stocked with small fish. The breeding and protection of insectivorous birds, such as swallows and martins, should be encouraged. Thorough screening of houses and cisterns is necessary to prevent the spread of malaria or yellow fever. The continued breeding of any kind of mosquitoes, with the attendant menace to public health and to the life and comfort of man and beast, is therefore the result of ignorance or neglect.

UNIVERSITY OF EDINBURGH.

CERTIFICATES IN TROPICAL MEDICINE.

IN the Calendar of the University of Edinburgh the following candidates are announced to have gained certificates in the department of Diseases of Tropical Climates, conducted by Dr. Andrew Davidson.

First-class Honours.

Alexander Edington, M.D.	Equal (Medallists).
Major Owen St. John Moses, I.M.S.	
D. Morley Mathieson, M.A., M.B.	
James Sutherland Edwards.	
Major Bryson, I.M.S.	
William H. Hill, M.D.	
Charles Chaves, M.B.	Equal.
W. M. P. Henderson	
K. R. Tampi.	
J. S. Manson.	
Robert M. Wishart.	
P. Lornie.	
J. A. MacLeod	Equal.
Arthur Dangerfield, M.B.	
Halliday Gibson Sutherland	
W. O. Sclater.	
E. W. Dyer.	
John Hunter, M.B.	
A. M. Dick.	
A. J. S. Walwyn.	
Graham Robertson	Equal.
John Macdonald	
Harley P. Milligan.	

Second-class Honours.

J. Theodore Young, M.B.	Equal.
Hugh Jamieson, M.D.	
T. H. Dickson	

PRELIMINARY LIST OF SUPPORTERS OF THE COLLECTION IN AID OF THE GREEK ANTI-MALARIA SOCIETY.

UNDER THE PATRONAGE OF H.R.H. PRINCESS CHRISTIAN.

HIS EXCELLENCY SIR FRANCIS ELLIOT, G.C.V.O., K.C.M.G., British Minister at Athens.

His Excellency M. Metaxas, G.C.V.O., Greek Minister in London.

Mr. Sp. Acratopulo, Liverpool.

Dr. Clifford Allbutt, F.R.S., Professor of Medicine, University of Cambridge.
Alderman J. Ball, Lord Mayor of Liverpool.
Mr. E. Benachi, President of the Greek Community of Alexandria (Egypt.)
Mr. R. C. Bosanquet, Professor of Classical Archæology, University of Liverpool, and Institute of Archælogy.
Sir James Creighton Browne, F.R.S., Treasurer, Royal Institution of Great Britain.
Mr. James Cantlie, Editor JOURNAL OF TROPICAL MEDICINE.
Professor Carter, M.D., Chairman, Professional, Committee Liverpool School of Tropical Medicine.
Dr. Caton, Emeritus Professor, University of Liverpool.
Mr. T. E. Collcutt, F.R.I.B.A., President of the Royal Institute of British Architects.
Mr. M. Corgialeno, President of the Greek Community in London.
Vice-Chancellor A. W. W. Dale, University of Liverpool.
Professor the Rev. S. R. Driver, Regius Professor of Hebrew, Oxford.
Sir John Evans, F.R.S., President, Royal Numismatic Society.
Dr. Frazer, LL.D., Trinity College, Cambridge.
Mr. J. Garstang, Institute of Archæology.
Mr. Griffiths, United States Consul, Liverpool.
Professor Herdman, F.R.S., President of the Linnean Society of London.
Sir Alfred Jones, K.C.M.G., Chairman, Liverpool School of Tropical Medicine, and President, Liverpool Chamber of Commerce.
Professor Macalister, M.D., St. John's College, Cambridge.
Dr. Mahaffy, D.D., Trinity College, Dublin.
Mr. B. A. Malandrinos, Greek Consul in Liverpool.
The Right Hon. Viscount Mountmorres.
Sir Shirley Murphy, Medical Officer of Health, London.
Mr. A. Natzio, Manchester.
Mr. G. Hall Neale, President, Liverpool Academy of Arts.
Mr. P. E. Newberry, Institute of Archæology.
Sir Christopher Nixon, LL.D., Ex-President, Royal College of Physicians, Ireland.
Dr. G. H. F. Nuttall, Ph.D., Professor of Protozoology, Cambridge.
Dr. Osler, F.R.S., Professor of Medicine, University of Oxford.
Mr. Alex. Pallis.
Mr. Rushton Parker, F.R.C.S., Professor of Surgery, University of Liverpool.
Sir Richard Douglas Powell, Bart., M.D., President, Royal College of Physicians.
Mr. G. C. Ralli, Liverpool.
Messrs. Ralli Brothers, London, Liverpool, Manchester, &c.
The Right Hon. Lord Rayleigh, O.M., President of the Royal Society.
The Right. Hon. Lord Reay, G.C.S.I., LL.D., President of the British Academy.
His Excellency Sir John Rodger, K.C.M.G., Governor of the Gold Coast.
Dr. J. Rutherford, Harrogate.
Mr. Watson Rutherford, M.P., Liverpool.
Dr. C. G. Savas, Professor of the University, Athens.
A. E. Shipley, Esq., F.R.S., Cambridge.
Mr. J. J. Stavridi, Greek Consul-General in London.
The Right. Hon. Lord Stanley, K.C.V O., C.B.
Mr. D. Steele, Lake Kopais Company, Greece.
Dr. Traill, LL.D., Provost of Trinity College, Dublin.
Sir Frederick Treves, Bart., F.R.C.S.
Robert Wallace, Esq., F.R.S.E., Professor of Agriculture, Edinburgh University.
Sir Henry Wood, Secretary, Society of Arts, London.
Mr. G. Zlatano, Manchester.
Mr. G. B. Zochonis, Manchester.

Geographical Distribution of Disease.

As information arrives we publish, under this heading, the principal diseases met with in tropical and sub-tropical countries, so that those interested in the Geographical Distribution of disease may have a means of gathering information concerning the prevalent ailments in different parts of the world.

PREVALENCE OF CANCER.

To the Editors of the JOURNAL OF TROPICAL MEDICINE.

SIRS,—In reply to your correspondent, Dr. Branch, I would mention that I can recall, during a practice here of eleven and a half years, four cases of epithelioma in Soudanese slave women brought to Morocco, and without any admixture of Arab blood. They came under notice at a late stage, and died with disseminated growths. I may have had more in the dispensary, but my case books do not mention the colour or race of the patients.

I think cancer of all kinds, except rodent ulcer, which I have never seen here, is at least quite as common as in England. Of course, the Arabs largely predominate over the pure blacks. My work, being confined to women and children, excludes case of cancer special to men.

Yours faithfully,

Women's Hospital, Tangier, Morocco. GABRIELLE BREEZE, M.B.

India.

Malignant Diseases.—At the London Mission Hospital Tammaladugu, Southern India, the following operations for malignant diseases were performed during 1905:—

Epithelioma—arm (excised)	... ...	1
loin ,,	... ...	1
anus ,,	... ...	1
penis, partial removal	...	1
total extirpation	..	1
tongue, removal of half		1
cheek and lip	... ...	3
lower jaw, half removed		4
palate	... ...	1
scirrhus of breast amputation	... ...	8
Sarcoma breast, amputation	... ...	1
Rodent ulcer	... ...	1
Myosarcoma buttock	... ...	1
Lymphadenoma	... ...	1
Cancerous degeneration of ovarian tumour	... ...	1

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the JOURNAL OF TROPICAL MEDICINE *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"The China Medical Missionary Journal," September, 1906.

I. AN UNDESCRIBED FORM OF ASCARIS AND ITS EGG.

Logan, O. T., writing from China (place not stated) states that he has found an undescribed egg in the fæces. The egg may be, he suggests, an abortive or partially developed egg of a lumbricoid. He has further noticed that the parent female worm has a constriction about one-sixth inch wide, which encircles the body at the junction of the middle and anterior thirds. These observations correspond to those made by Dr. Crichton Wellman in South Africa, who found a worm with a constriction similar to that described by Dr. Logan, who asks if this is a new species.

An interesting clinical fact noted by Dr. Logan is that he had seen a round worm passed by the urethra.

II. From Hangchow, Fokien, a communication concerning the prevalence of diseases was as follows: (1) Beri-beri: rare, a few cases in twenty-five years, not endemic. (2) Cholera: sporadic cases only. (3) Dysentery: common, mostly chronic, mortality not high. (4) Hernia: very common. (5) Malarial fever: common and virulent. (6) Plague: no plague. (7) Pneumonia: common and deadly. (8) Typhoid: common, but of mild type. (9) Urinary calculi: several cases every year operated on.

Of the diseases enumerated in this table, the most unexpected is the frequency of hernia. Most observers in China hitherto have constantly remarked upon the extraordinary few cases of hernia seen amongst the Chinese.

III. SUICIDES BY OPIUM IN CHINA.

In the annual report of the Chinese Hospital, Shantung Road, Shanghai, for the year 1905, the number of attempted suicides by opium is remarked upon. No fewer than 318 cases of this nature were brought to the Hospital, 196 being males and 122 females. Of this number, 25 died and 293 recovered. When one thinks of the number of cases never brought to hospital, and that the above figures represent the cases brought to one hospital only, the extent of attempts upon life by this means throughout the length and breadth of China must be appalling.

IV. MALIGNANT DISEASES IN CHINA.

Dr. Kuhne, in his report of the Tungkun Hospital, states: "Cancer and epitheliomata are not so frequent as in Europe; on the other hand, fibromata have a tendency to become malignant, and lymphadenomata are often a cause of death."

"Journal of Amer. Med. Soc.," April 28, 1906.

I. A REVIEW OF CANCER IN THE UNITED STATES OF AMERICA, ACCORDING TO THE TWELFTH (THE LAST) CENSUS. By Guthrie McConnell, M.D.

Conclusions.

(1) That cancer appears to have actually increased in the United States; 12·1 deaths per 100,000 population in the past ten years.

(2) That the death-rate is higher in the rural districts and small towns than in the cities.

(3) That native whites suffer much less than the foreign whites.

(4) That the death-rate amongst the foreign whites in the United States is only apparently greater than in their own homes.

(5) That 63·1 per cent. of all cancer cases are in women, and 36·9 per cent. in men.

(6) That those employed in hard outdoor work have a higher cancer mortality than the sedentary classes.

(7) That the areas showing the greatest mortality are mountainous regions that are well watered and timbered.

(8) That cancer does not seem to be generally more prevalent along rivers.

(9) That those cities in which there are both a large German population and large brewing interests do not show a corresponding increase in cancer mortality.

(10) That cancer mortality is greatest in persons of 65 years and over.

(11) That the average age at death is 58·1 years.

II. MALARIA INFECTION IN CERTAIN NATIVE VILLAGES OF THE CANAL ZONE. By A. I. Kendall, M.D.

Summary and Conclusions.

(1) Malaria existed in certain towns of the Canal Zone at the time this work was done to such an extent that over 50 per cent. of the native born and 70 per cent. of the foreign born harboured parasites in their peripheral circulation.

(2) This high percentage of infection does not necessarily mean that a corresponding number present febrile symptoms; in fact, many do not.

(3) This high percentage of infection is a menace to the health of those who, by reason of their work, may be compelled to remain in such towns, particularly because of the wide distribution of the *Anopheles albipes*, a mosquito shown to be capable of transmitting malaria. Other Anopheles to a lesser extent may also be factors in distributing malaria.

(4) The æstivo-autumnal malaria is the prevalent type; the Chagres fever is, in all probability, a severe æstivo-autumnal infection. Pernicious malaria is not caused by a new parasite, but by an æstivo-autumnal organism of exalted virulence.

(5) Natives and their descendants or, in general, the descendants of those who have lived continuously on the Isthmus of Panama for many years, at birth have, to a certain degree, an inherited immunity; an active immunity, which is by no means absolute, is generally acquired, becoming manifest at about the age of 16. The foreign born acquires a tolerance to the malarial organism; this tolerance, however, is not as great, nor does it begin as early, as is the case with natives.

(6) Malaria is an environmental disease; occupation has very little to do with the cause of this disease.

(7) Quinine in moderate daily doses, while not absolutely guaranteeing freedom from malaria, or completely driving organisms from the circulation, has an important preventive and curative effect.

"C. R. Soc. Biol.," T. lx., p. 659.

SERUM REACTION DURING THE COURSE OF MEDITERRANEAN FEVER.

Soulie, H., and Garden, V. In thirteen cases in which the agglutinating power of the serum was tested daily, the authors found this variable; and in the same patient the power might disappear altogether on certain days. The serum reaction of 122 patients, suffering from different diseases, for the *M. melitensis*, was always negative up to $\frac{1}{30}$.

The agglutinin is destroyed by heating for five minutes to 60°, a quite exceptional fact, which is duly emphasised.

A CASE OF INVASION OF THE OVARY OF A CRAB BY THELOHANIA MÆNADIS.

Pérez, Ch. (*ibid.*, p. 1091), describes an exceptional case in which the ovary of the crustacean was infected by this microsporid in the stage of young sporonts. The parasite had completely invaded the ovary, forming the greater part of the mass. There were a few healthy ovules, some foci of germinal proliferation, eosinophile amœbocytes, and reticules of follicular phagocytes, evidently engaged in absorbing large vitilline patches, which were evidently the remains of large ovules.

THE BACILLI OF A DYSENTERIFORM EPIDEMIC AT TUNIS.

Nicolle, C., and Cathoire (*ibid.*) isolated two forms: (1) A bacillus of a strain resembling that of Shiga and Chantemesse, and differing from that of Flexner II., which ferments maltose, dextrine, saccharose, and soluble starch only, and produces only indol in peptonised water. The ingestion of a few drops of the culture was sufficient to produce the disease in a young rabbit. (2) A mobile bacillus, the cultures of which smelt like those of *B. coli.* Subcutaneous innoculation of an adult rabbit with 1 cc. of this culture in bouillon failed to reproduce the malady. It produced indol in peptonised water, but did not ferment lactose. It did not agglutinate with dysenteric serum, and the corresponding serum did not agglutinate the micro-organism of true dysentery.

THE EXPERIMENTAL STUDY OF BERI-BERI.

Salanone, Henri (*ibid.*, p. 1117). The research in question was made in the bacteriological laboratory of Hanoi, and consisted in inoculating the dura mater or substance of the pectoral muscle of pigeons with an emulsion of the pneumogastric nerve of a beri-beri case. There resulted a progressive paralysis of the legs and wings.

The blood and pulp of the internal viscera of the same patient proved to be harmless when employed in the same way.

From these pigeons M. Salanone has isolated a diplococcus having many of the characters of that described by Okata and Kokubo. It will not stain by Gram's method, slightly clots milk, and attacks lactose.

The cultures on bouillon and on serum have a smell like stale fish. This microbe kills rabbits, mice, guinea-pigs, pigeons, fowls, and monkeys when inoculations are performed either *viâ* the dura mater, the peritoneum, or the trachea, and when the case terminates quickly, the lesions of acute beri-beri are very obvious.

Marked vaso-motor paralysis, with congestion of the internal organs, degeneration of the heart muscle, effusions into the peritoneum, pleura, and pericardium. A pure cultivation of the diplococcus was recovered from the heart-blood of the mouse. In fowls and monkeys this disease takes a chronic course, and in the monkey it recalls the "dry" form of beri-beri, with polynephritis, typical paralysis of the extensors of the limbs, marked wasting, and, to a certain extent, muscular atrophy.

"Philippine Journal of Science," T. i., p. 169.

BERI-BERI IN THE JAPANESE ARMY DURING THE LATE WAR.

Herzog Maximilien. In August, 1905, the author proceeded to Japan, to study beri-beri, of which some 80,000 cases had occurred in the Japanese Army, and to study a coccus, which was believed to be the cause of the disease by the Japanese physicians, Okata and Kokubo. The coccus was described by the latter in the *Journ. Milit. Surg. Assoc.*, September, 1905, as follows, and was named by them *Kakkecoccus*:—

"A diplococcus, scantily found in the blood of cases of beri-beri, immobile, without capsule, and staining well with analine colours. By pricking the region of the trapezius after cleansing the skin, they found this coccus in the blood in 65 cases, both by culture and by the examination of cover-slips; in 11 cases by the examination of the latter only, the cultures being negative; in 19 cases by culture, the microscopic examination being negative; while in 34 cases the examination was absolutely negative. The diplococcus grows rapidly on gelose at 37°, and very slowly at 10°. In bouillon, 37°, there was a greyish deposit at the bottom of, and adhering to the sides of the tubes, the liquid remaining quite clear; in gelatine no liquefication; in serum a fine grey cultivation; on potato a bright yellow deposit; does not ferment sugar; and does not clot milk. They isolated the same microbe from the urine 15 times, and from the stools in 45 cases."

The results of inoculating animals with the blood of beri-beri cases, with cultures of the coccus, or with the spleen of infected mice were indecisive: 3 rabbits out of 21, and 15 mice out of 64 succumbed, while 7 guinea-pigs all survived. Kokubo has prepared a serum by inoculating rabbits, which in a hanging drop agglutinated the coccus in a dilution of 1 per cent. in two hours.

Following Kokubo's methods, Herzog succeeded in isolating the coccus from the urine in 8 out of 40 cases, but he failed to isolate it from the blood of patients; and he points out that the precautions taken by Kokubo would not prevent the blood obtained from being contaminated by the secretions of the sudorific and sebaceous glands. They were not allowed to take blood directly from the median cephalic vein.

In the only autopsy that could be obtained the coccus was isolated from the kidneys and the meningeal fluid.

On returning to Manila, Herzog inoculated monkeys and other animals with the coccus, but, as yet, with indecisive results. He is, however, continuing his researches.

"Archiv. f. Schiff. und Tropen-Hyg.," T. x., p. 399.

PRELIMINARY NOTICE ON THE KAKKECOCCUS AS A CAUSE OF BERI-BERI.

Truzuki obtained a diplococcus 7 to 8 μ by 4 to 6 μ from the urine in 18 out of 65; and from the stools in 22 out of 30 cases of beri-beri. The organism exhibited only the Brunonian vibration, and was a facultative anærobe which produced no spores, and did not liquefy gelatine. It is stained by Gram's method, and grows on ordinary media at laboratory temperature, but best at 37°. Either in culture media or in the intestine it produces a toxin, which acts selectively on the nervous centres.

The author claims to have reproduced the characteristic symptoms of beri-beri in animals, but only by intra-cerebro-spinal inoculation, and states that his microbe agglutinates with the serum of patients affected with the disease. He further states that his diplococcus may be found in the intestine of healthy persons, but regards this as a parallel case to that of such persons acting as carriers of the cholera vibrio. It may be noted that this organism stains by Gram's method, whereas, as noted above, Herzog found that Kokubo's coccus did not do so. Altogether it seems doubtful if Truzuki is really dealing with the same organism, and it seems more than doubtful that his can be considered the true organism of beri-beri.

"Journ. Americ. Med. Assoc.," April 28, 1906.

GENERAL INFECTION BY A PROTOZOON PRODUCING A PSEUDO-TUBERCULOSIS OF THE VISCERA.

Darling, Dr. J. T. Writing from Acton, in Panama, the author describes a curious case of what appeared to be general miliary tuberculosis, but which on *post-mortem* examination proved to be due to an invasion of the organs by bodies which he regards as protozoa, for which he proposes the name *Histoplasma capsulata.* The supposed protozoa consisted of round or ovoid bodies about three microns long, provided with a sort of capsule, contents of which are variable as regards chromatin. They present some resemblance to the Leishman-Donovan bodies, and were sometimes combined into irregular masses like miliary tubercles. In the lungs these bodies occupied the interior of the alveolar epithelial cells, and in the liver the endothelial and hepatic cells. In the spleen and bone-marrow, on the other hand, the parasites were free in the plasma, though they were also found within the mononuclear leucocytes. He has since met with a second case of the disease.

"Philippine Journ. Sc.," 1906, p. 533.

TROPICAL SPLENOMEGALY.

Wooley, Paul G. The symptoms of seven cases observed by the author had much in common with Kala-Azar: Diarrhœa, enlargement of the spleen, transitory œdema an irregular temperature, rheumatoid pains, wasting and

feebleness, and probably anæmia. Hypertrophy of the liver is not a constant symptom, and quinine proved useless, the most important symptom being the hypertrophy of the spleen. In the Philippines, at any rate in Wooley's cases, the symptoms are not due to the *Piroplasma Donovani*, nor did they appear to be referable to the effects of malaria or syphilis; but he regards them as rather of intestinal origin, and due to ulcerations or other inflammatory lesions. In one of his cases, diagnosed as an instance of "Banti's" disease, Wooley isolated, both before and after death, a microbe in the form of a rodlet or diplococcus, staining well by Gram's method, and yielding a characteristic cultivation; but the injection of monkeys with the microbe gave only negative results. He concludes, therefore, that a variety of distinct morbid conditions are confused under the title of febrile tropical splenomegaly.

"C. R. Soc. Biol.," T., lx., p. 1149.

PROTOZOA OF ORIENTAL SORE.

Billet, A., found in a case originating at Ismailia, the protozoon described by Wright, Margenovski, and Bogroff, and gives a good description of the organism. With respect to the mechanism of propagation of the disease, he notes a case in which one of these sores developed exactly on the site of a mosquito bite. Now Ismailia, Touggourt, and Bokia are all places where the *Anopheles chaudoyei* has been found, and the distribution of this mosquito in Algeria corresponds exactly with that of "Biskra boil."

Billet, A. (*ibid.*, p. 1151), on a case of intermittent œdema associated with *Filaria loa*.

The author describes a case of the above such as would be described by us as Calabar swellings. An adult specimen of *Filaria loa* was extracted from the left lower eyelid. Some time after young filaria having all the characters of *F. diurna* were found in the blood, during the day only, associated with a marked eosinophilosis.

"Deutsche Med. Wochenschrift," August 16, 1906.

Meyer found in cases of dysentery the *Entamœba histologica* of Schaudinn.

"La Presse Medicale," April 28, 1906.

BANTI'S DISEASE.

Noumanbey maintains that the term Banti's disease should be confined to cases in which there is enlargement of the spleen of long standing, anæmia, enlargement of the liver, and ascites. He is of opinion that malaria is the cause of the disease. He found malaria parasites in one case. It may be remarked that although malaria parasites were found in one case, it is mere assumption to affirm that they stood in the position of cause and effect.

"Bulletin de l'Academie de Médicin," vol. lxx., No. 32.

PATHOGENESIS AND PROPHYLAXIS OF MALARIA.

Kelsch accepts the mosquito theory of the malaria infection, but considers that other modes of infection exist, citing turning up of the soil, exceptionally hot seasons, ingestion of dust-laden food, fatigue, and general unhygienic conditions. He asserts that the geographical distribution of Anopheles and malaria do not coincide. Kelsch has never known of a case of direct transmission of malaria from man to man.

"Medical Record," July 28, 1906.

Moulden W. R., from observation on prisoners in Manila, finds that copper has a selective action on dysentery due to *Amœba coli;* copper solutions are better borne than quinine; patients make a more rapid recovery under its use, gaining flesh and strength more rapidly than under any other method; and, most important of all, cases remain cured, provided, of course, that treatment is kept up a reasonable time after the disappearance of the amœba from the stools.

"Medizinische Blatter," March 8, 1906.

ANKYLOSTOMA AND MALARIA.

Schewald states that in Brazil many patients with malaria harbour ankylostomes. Anthelmintics, by getting rid of the worms, also cause the disappearance of the malarial symptoms without taking quinine.

The worms usually contain malarial parasites, which enter by the alimentary canal of the ankylostome and pass to the salivary glands, as in Anopheles; the parasite is not found in the ova, but malaria may possibly be transmitted or acquired through eggs.

When the ankylostome sucks blood, the malarial organisms are injected into the blood-current of the host. This may explain refractory cases of malaria, and the recurrence of attacks at the same time each year.

"British Medical Journal," October 20, 1906.

SPIROCHÆTES IN YAWS AND GRANULOMA PUDENDI.

MacHennan reports that he has discovered spirochætes in smears from a papilloma occurring in recurrent yaws. The spirochæte met with resembled the *Spirochæte pallida*, but the staining (by Giemsa's solution and gentian violet) proved fainter. In the granuloma tissue itself a few organisms resembling *Spirochæte refringens* were seen, and a number of highly refractive very long spirochætes with fine and close waving were found, but no organism resembling the *S. pallida*.

"2nd, 3rd, and 4th Memoires of the French Mission to Rio de Janeiro, to Study Yellow Fever."

HEREDITARY TRANSMISSION OF YELLOW FEVER GERMS BY STEGOMYIA.

Marchoux, E., and Simond, P. L. Having proved that infection of *Steg. fasciata* by *Nosema stegomyiæ* is usually effected by heredity, the authors endeavoured to ascertain if the same is the case with the yellow fever germ, and have succeeded in infecting a healthy subject by causing him to be bitten by a female Stegomyia, hatched out from a batch of eggs laid by an infected female. Epidemological facts, however, appear to show that hereditary infection cannot persist through several generations of mosquitoes, and that it plays but a small, though by no means negligible, part in the propagation of the disease. It is obvious, however, that the destruction of eggs and larvæ assumes a new importance in prophylaxis.

We as yet know but little of the conditions that bring about an increase or diminution of the virulence of the virus within the mosquito. May it not be the case that hereditary transmission has an attenuating action? Should further experimentation show that mosquitoes infected in this way communicate only a mild form of yellow fever, it may be important to ascertain if inflammatory bilious fever, which is usually considered to be a form of yellow fever, may not be simply due to this method of communication.

INFECTION OF STEGOMYIÆ BY CONTACT WITH DEAD INFECTED MOSQUITOES.

Three series of experiments were conducted by the authors to ascertain if this is possible, and their results are negative, and larvæ placed in a flask containing dead infected Stegomyiæ developed into adults which showed no sign of virulence.

The authors have often observed that Stegomyiæ avoid parts of the skin fouled with the excretions of patients. If, then, such excretions are virulent, which, however does not appear to be the case, the mosquitoes would not become infected in this way.

It appears that a fairly high temperature is necessary for the development and preservation of the infection within the mosquito after it has absorbed the virus of yellow fever, but the exact conditions of temperature cannot, as yet, be stated.

An orang and a chimpanzee were made to be bitten by infected Stegomyiæ obtained from Brazil, and seven and nine days after both animals showed an elevation of temperature but without other symptoms that could be interpreted as certainly due to yellow fever.

All attempts at infecting animals with cultures made *in vitro* having failed, efforts were made to cultivate the virus *in vivo* within mosquitoes.

Infected mosquitoes were ground up with glucose and physiological solution and fed to Stegomyiæ, which were subsequently made to bite a man. As a result, the subject of the experiment developed a distinct form of yellow fever. It follows, therefore, that infection can be conveyed from one mosquito to another, but only by methods practicable only within the laboratory. It affords, however, a convenient method of producing infected mosquitoes for experimental purposes.

Experiments on the conveyance of yellow fever by mosquitoes of other species than *Stegomyia fasciata* have proved negative. It may be added that in most other species the female dies immediately after laying a first and only batch of eggs, and that this circumstance hardly admits of sufficient time for the virus to develop within her.

The authors have proved that this is the case with *Culex fatigans*, *C. tæniorhynchus*, *C. cocfirmatus*, *Janthinosoma musica*, *Psorophora ciliata*, and *Tæniorhynchus Arribalzagæ*. *Stegomyia fasciata*, on the other hand, can lay six or seven batches of eggs, provided she obtains a feed of blood after each, and, in the free condition, produces on the average two or three batches.

Researches into the life-history of *S. fasciata* showed that it can bite man either by day or by night from the first days of its adult life. After a few days, however, particularly after laying her first batch of eggs, she bites only during the night, and it therefore follows that man becomes infected almost universally during the hours of darkness. A feed of blood is indispensable to the mosquito for the production of eggs.

The authors further give new ideas as to infantile yellow fever; abortive forms of the disease—immunity, relapses, and the endemicity of yellow fever.

For the preservation of specimens of mosquitoes they recommend enclosing the insects in glass cells, the feet being stuck down with Canada balsam.

The abstractor has, however, tried this plan, and found it difficult to prevent the development of moulds on specimens preserved in this way in a warm, damp climate.

In the fourth memoir are given descriptions of the microscopical lesions found in yellow fever, accompanied by some fine coloured plates. They regard yellow fever as a sort of generalised stentosis, all the organs being more or less affected with fatty degeneration. The glands of the skin and intestine, and the epithelial investment appear, however, to always escape. The tissues were fixed in Borrel's liquid, and stained with magenta-picro-indigo-carmin, or fixed in acidified perchloride and stained with hæmatin and orange solution.

"Arch. Inst. roy. de Bacter., C. P.," 1906, p. 127.

THE TRYPANOSOMES OF AMPHIBIANS.

França, C., and Athias, M., found six *Rana esculenta* from the neighbourhood of Lisbon infected by trypanosomes which they identify as *T. rotatorium* (Mayer), but conclude that two species are really included under the name: *T. concalum* or *costatum* (Mayer), with an ovoid, usually fairly broad body, and striated or unstriated with centrosome near nucleus; and *T. rotatorium* (Mayer), with the body more slender, the centrosome placed near the hinder extremity, and a very well-developed undulatory membrane extending the whole length of the body.

Commenting on the paper in the *Bulletin de l'Institut Pasteur*, September 30th, p. 756, Prof. F. Mesnil states his opinion that had the authors examined a larger number of infected frogs they would have met with intermediate forms and would also find forms with the hinder extremity as elongated as the *T. mega* and *micro-karyozeuton* of Dalton and Todd. In any case he regards the constitution of new species as "a little premature."

The diagnosis of these proposed new forms is: *T. undulans*, 30 by 6-9 microns, with broad undulatory membrane and no free flagellum. *T. elegans*, of same length but only 3 microns wide. They have also met with Sergent's *T. inspinatun.*

The authors lay great stress on the globular or retracted forms assumed by the large trypanosomes after issuing from the vessels, the fate of which had already been made out by Danilewsky, and have followed the process in two individuals from the assumption of the globular form to the disappearance of the undulatory membrane and flagellum. They saw one of the two undergo division into eight segments each with its own nucleus, and finally all degenerate, but they were unable to follow the process in stained preparations.

The same observers in the *C. R. S. Soc. Biol.*, T. lx., p. 1108, describe the phenomena of the division of *T. rotatorium S. Str.* from *Hyla arborea.* It takes a rounded form, losing its membranes and flagellum. The blepheroplast and nucleus divide, the former appearing to play the part of a centrosome in the division of the nucleus. This is especially clear in the process of passing from the second to the fourth nucleus stage, although the authors do not state that it is effected by mitosis.

In preparations fixed at once only the initial stages can be found, the other stages being only obtainable in preparations kept five hours between cover and slip previously to fixation.

EXCHANGES.

Annali di Medicina Navale. Annal d' Igiene Sperimentale. Archiv für Schiffs u. Tropen Hygiene. Archives de Médicin—Navale. Archives Russes de Pathologie, de Médec. Clinique et de Bacteriologie. Australasian Medical Gazette. Boletin de Medicina Naval. Boston Medical and Surgical Journal. Bristol Medico-Chirurgical Journal. British and Colonial Druggist. British Journal of Dermatology. British Medical Journal. Brooklyn Medical Journal. Caducée. Clinical Journal. Clinical Review. Giornale Medico del R. Esercito. Hong Kong Telegraph. Il Policlinico. Indian Medical Gazette. Indian Medical Record. Indian Public Health. Interstate Medical Journal. Jahresbericht. Janus. Journal of the Royal Army Medical Corps. Journal of Balneology and Climatology. Journal of Laryngology and Otology. Journal of the American Medical Association. Journal of Experimental Medicine. La Grece Medicale. Lancet. Liverpool Medico-Chirurgical Journal. London and China Express. Medical Brief. Medical Missionary Journal. Medical Record. Medical Review. Merck's Archives. New York Medical Journal. New York Post Graduate. Pacific Medical Journal. Philippine Journal of Science. Polyclinic. Revista de Medicina Tropical. Revista Medica de S. Paulo. Sei-i-Kwai Medical Journal. The Hospital. The Northumberland and Durham Medical Journal. Transactions of the American Microscopical Society. Treatment. West India Committee Circular. West Africa.

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Original Communication.

RODENT ULCER IN A NUBIAN WOMAN.

By Andrew Balfour, M.D., &c.

Director Wellcome Research Laboratories, Gordon College, Khartoum.

Gentlemen,—In view of the letter from Dr. Branch, of St. Vincent, which appeared in your issue of November 1st, asking if any of your readers have observed rodent ulcer in negroes, the accompanying photographs of a Nubian woman suffering from that condition may be of interest (see Plate).

The patient, who, at the time the photographs were taken, was under the care of Major Bray, E.M.C., was aged about 60, a native of Nubia, and had lived in Egypt for a long time as a slave. She returned to the Sudan in 1901, and went to live at Kodok (late Fashoda) on the White Nile. While there she developed an ulceration at the right side of the root of the nose. This was scraped and healed. A nodule then appeared at the inner canthus of the right eye. The growth broke down and formed a typical rodent ulcer, which at the time the photograph was taken had persisted for one year, and for which the patient refused any treatment. It will be noted that she possessed rather a leprous type of countenance, though there was nothing to indicate that she was suffering from leprosy,

November 21st, 1906.

A BLOOD-SUCKING HEMIPTERON.

By Harold H. King.

Economic Entomologist to the Wellcome Research Laboratories.

As will be seen from the second report of the Wellcome Research Laboratories, the Sudan is by no means deficient in blood-sucking diptera, and since that report has been issued several species, hitherto unrecorded from this country, have been captured. Particulars of these will appear in due course, but in the meantime the occurrence of a blood-sucking insect belonging to a different natural order, viz., *Hemiptera*, seems worthy of notice.

This little bug is one of the family *Reduviidæ*, sub-order *Heteroptera*, and is therefore allied to the Ochindundu (*Phonergates bicoloripes*, Stall.) recorded in the Journal of Tropical Medicine of April 2nd and April 16th of this year, from Angola as feeding on ticks and occasionally attacking man. Up to the present I have been unable to ascertain its species owing to the scantiness of the available literature, but some idea of its general appearance may be gathered from the following sketch and description.

Length, 2·25 by 2·5 microns.

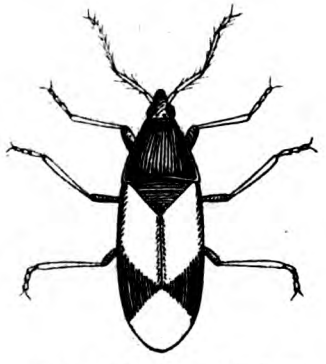
Head black, with posterior margin brownish; compound eyes black; two brown ocelli above and slightly posterior to the compound eyes.

Proboscis three jointed, of medium length, black with a brownish tinge.

Antennæ four-jointed and inserted low on the head. First joint black and slightly swollen; second, longer and tinged with brown; third and fourth, slender, brownish. All, especially the two apical segments, bear hairs.

Thorax greenish black; scutellum of moderate size, black, tinged with brown.

Wings, front pair, basal portion yellowish, a dark triangular patch on the costal border, apical portion membranous, hind pair membranous.



Line | indicates natural size.

Legs, coxæ and femora blackish, trochanters, tibiæ and tarsi yellow; femor a of fore pair swollen; tarsi three-jointed, abdomen black, fringed with pale hairs.

Head, thorax and abdomen sparsely clothed with short, pale, backwardly-projecting hairs.

Most of the members of the family *Reduviidæ* are predacious in habits, preying upon insects, and several species have been noticed attacking man, generally when handled or otherwise molested. I have not seen the young forms of this Hemipteron, but the adult was frequently taken during the evenings of the month of October, biting the hands and wrists without provocation. In captivity, if placed on the hand during the day it would not hesitate to at once plunge its proboscis into the skin and commence to feed, causing a sharp, stinging pain. A small red lump was the only after effect noticed, and this usually soon disappeared.

DENGUE IN EGYPT.

By Llewellyn Phillips, M.D., B.C., M.A.Cantab., F.R.C.S.Eng., M.R.C.P.Lond.

Professor of Clinical Medicine, Egyptian Government School of Medicine, Cairo.

During this past summer and autumn there has been an epidemic of dengue in Egypt, and a large number of cases came under my observation. The earliest cases that I saw were not at all typical, for in several the fever lasted seven to ten days and there was no rash, and I thought they were either influenza or some undescribed form of simple fever; but as time passed they became more typical, severe pains being a marked feature of the cases, and rashes began to appear. In Cairo the epidemic was at its height in September and October, large numbers of officials who returned from leave at the beginning of October

falling victims. Not only did Europeans suffer, but many Egyptians as well.

In most cases the disease ran its course in about a week, the initial fever lasting two to five days. In some instances there was a rigor during the course of the initial fever; the terminal fever, however, was not always noted. In several cases there were very severe pains in the eyeballs, and in some, pain in the testicles. The terminal rash took several forms; whilst many had the typical morbilliform rash starting on the hands and spreading to the body, in others it took the form of an erythematous blush. In two instances I noted typical urticaria, one patient being taken ill with pains and slight fever on a Friday night, on Saturday night a rigor occurred, the temperature falling to the normal at 2 a.m. on Sunday morning. On Tuesday morning, a typical urticarial rash appeared all over the body without a rise of temperature being noted, and lasted about twenty-four hours. In others it took the form of purpura. An Egyptian whom I saw in consultation on the sixth day of his illness had a copious petechial rash over his hands, arms, and chest, and also had hæmorrhages from the nose, stomach, and rectum. The case looked somewhat like typhus, but the temperature was beginning to fall, the mental condition was quite clear, and the patient's appetite was returning. The temperature was normal the next day. I met him out at the Pyramids a few days later, quite well; he was, however, rather weak. In the case of a little Egyptian girl, a few days after the apparent termination of the disease there occurred profuse epistaxis and a copious purpuric rash with vibices, and large blood-stained blebs on the lips. In many instances the secondary rash was absent.

On more than one occasion I saw epistaxis occur as a sort of crisis. Hæmorrhages were a marked feature of the epidemic in Luxor and other towns in Upper Egypt.

In two instances I saw a second attack in the same patient. A young Englishman was taken ill in September with severe pains and fever. These lasted about three days, then he was free from fever and pain for two days, then they both recurred for a day; there was no rash. I saw him again in October with similar symptoms, and this time he developed with the secondary fever a typical morbilliform rash.

I only saw one death. This patient's urine was, however, loaded with albumen, and he died with uræmic symptoms, the temperature running up to 107·2° F., in spite of the application of cold packs.

Thus I observed great variety in the secondary half of the disease, fever occurring without rash, and rash without fever, unless it was so transient as to be overlooked, and neither or both occurring. Lastly, as I have described above, there was a great variety in the rashes. The occurrence of hæmorrhagic forms of the disease is especially noteworthy.

As regards treatment, I found aspirin or salicylate of soda the best means of relieving pain, with, in some cases, local applications. Feeding I did not worry much about, there being in many cases little or no desire for food of any kind, and as long as they took plenty of fluid I was quite satisfied. In some instances there was much vomiting and abdominal pain. For the hæmorrhagic cases and for the urticarial cases I used calcium chloride, which gave much relief in the urticarial cases. When there was much sleeplessness I found Dover's powder useful, but given in a large dose. As much weakness and depression was left behind I used to conclude treatment with strychnine and quinine, or arsenic and iron.

VOMITING SICKNESS OF JAMAICA.

By C. W. Branch, M.B., C.M.

In the Annual Report of the Senior Medical Officer of Jamaica for 1904-5, and again in that for 1905-6, Dr. Errington Kerr refers at some length to a condition there known as vomiting sickness. At his suggestion the Government of Jamaica issued a circular to the other West Indian Governments, asking if such a disease had been observed in other places by the medical men.

Not a Specific Ailment.

After a careful examination of the reported cases and the remarks of several of the Jamaica medical officers, one comes to the conclusion that the vomiting sickness is not a disease *sui generis*, but in part akee poisoning and in part a coterie of pathological conditions characterised in common by the clinical features of vomiting and convulsions.

In several West Indian Islands there is some one disease, so called, to which is popularly attributed all the rapidly fatal cases of illness. In St. Kitts this is the "jaunders," in St. Lucia "pleurisie," with its varieties, "fausse pleurisie" and "pleurisie manquée," in Tortola the "biles." No doubt the vomiting sickness enjoys a similar local reputation in Jamaica.

Course of Illness.

Vomiting sickness usually attacks children; often several cases happen about the same time in a village, sometimes two in the same house at once. It occurs most commonly about January, but also in other months of the dry season. The typical attack has a sudden onset with pain in the belly and vomiting; after a few hours' interval of comparative relief vomiting again begins, and is followed by convulsions, coma and death. The description of the cases, however, shows that there is considerable variation in the features of the fatal illnesses which are instanced as vomiting sickness. In several mention is made of fever. Grave cases are rarely seen by a medical man, and information can only be gathered from the parents. Cases seen in life and diagnosed as vomiting sickness usually recover.

The diseases which most commonly produce the symptoms of vomiting and convulsions in negro children are ascarides and malaria. The few deaths among adults attributed to vomiting sickness are perhaps due to one or other of several acute diseases, as in the case of the "pleurisie" of St. Lucia, for example, pneumonia, bilious remittent fever, and obstruction; some, perhaps, are even due to poisoning. The description of one case, together with the *post-mortem* findings, suggests an epileptic or syphilitic epileptiform seizure.

To illustrate paper by ANDREW BALFOUR, M.D., "Rodent Ulcer in a Nubian Woman."

Post-mortem Appearances.

The *post-mortem* appearances in the cases of vomiting sickness also vary somewhat, though evidences of convulsions seem to be usually present—meningeal hyperæmia, congestion of the choroid plexus, and venous engorgement of the lungs. With regard to the other findings, it may be said that the acute congestion of liver and kidneys was no doubt produced or enhanced by high temperature. The spleen enlarged, firm and congested, suggests malaria. The full bladder indicates coma. No examination of spleen or blood has been made for malaria. One medical officer, it is true, refers to this, with an offer to make such examination if the Government would provide him with a microscope. The authorities do not appear to have availed themselves of this offer, a neglect which is perhaps pardonable, for if the gentleman has waited twenty years for someone to give him a microscope, it may be doubted what use it could be to him now.

No attempt seems to have been made to obtain analysis of the gastric contents, even in cases where suspicion of poisoning might reasonably have been entertained. In the Report for 1905-6 are the details of two *post mortems* made the same day on children of one family who had died of "vomiting sickness." The appearances described are quite inconclusive, and hardly even characteristic of disease, yet the deaths were certified to be due to vomiting sickness, and no effort was made to exclude poisoning.

Mortality. Treatment.

All the observers agree that the mortality of vomiting sickness under treatment is small. But as the same writers profess to be entirely ignorant of the nature of the condition, such treatment as is applied must be empirical and symptomatic. Dr. Tillman, however, who treated 144 cases which he diagnosed as vomiting sickness, with only two deaths, used a most rational treatment. He gave promptly santonin and calomel, followed by a course of quinine. The success of this procedure should have suggested the true explanation of the symptoms. The rest of his treatment is symptomatic.

Ascarides and Malaria.

The District Medical Officers of Jamaica do not attend the labourers children free as part of their official work, as we do in the Leeward and Windward Islands, consequently they have not the opportunity of knowing how much sickness there always is among negro children in their natural state. It is only when attention is attracted by the occurrence of several deaths in rapid succession, that the medical officer may be called upon to investigate and to treat the children in the locality, or supply medicines to the police to treat them. Also the districts are larger and much of the population is remote from a medical man. The peasants are therefore far less accustomed, than with us in the Lesser Antilles, to that medical aid which is deemed a necessity of civilised life. The children are of small value and are readily replaced; to take them to a doctor costs I believe four shillings. At this price it must be extremely rare that a labourer will or can obtain medical advice for a child. With us, on the contrary, the children are frequently brought at the slightest ailment, and demands for worm powders are constant. On the whole, we must therefore have far fewer cases of grave infection with ascaris or malaria. Notwithstanding, we are familiar with "attacks of worms," and "worm fits," as they are called in St. Vincent, which correspond, by description, to much of the vomiting sickness. How much a West Indian population can harbour worms may be gathered from the fact that of 414 persons, mostly adults, of the labouring class, in St. Vincent, I found ova of ascaris in the fæces of 56 per cent. Of children it may be safely said that not one is free of worms unless he has been recently treated.

A Dry Season Disease.

Vomiting sickness is said to be prevalent in the months which constitute the dry season, especially January. Cases of this kind are no doubt always occurring, but they are at this period sufficiently numerous to excite alarm. In the dry season, as several of the observers point out, the people are apt to drink bad water. This means a prevalence of enteritis, due probably to balantidium, cercomonas, or trichomonas, all of which I have observed in St. Vincent in diarrhœas.

The consequent unrest of the worms excites reflex disturbances through the already irritated sympathetic. The general resistance, low before, is still more lowered by the diarrhœa, and these nervous disturbances are manifested as vomiting and convulsions.

Again, the dry season is the time for water-holes and rock puddles in the guts. In the heavy rains there is little opportunity for mosquitoes to breed in watercourses, but in the dry season there are occasional rains enough to fill puddles. It must be borne in mind that convulsions is often the first observed indication of a malarial attack in a child. Vomiting is common in the onset of many fevers. The combination of vomiting, convulsions and coma, with high temperature noted by some of the observers, is strongly suggestive of malaria.

The Akee Tree Fruit.

In Jamaica the presence of the akee tree forms a condition peculiar to that place among West Indian Islands. The white, brain-like interior of the fruit can be eaten raw and has a nutty flavour, though it is usually cooked and makes a delicious vegetable. In the centre, attached to the shiny black seeds and extending into the lobes of the white "meat," is a pink placenta in which is a poisonous principle. These placentas should be carefully picked out of the fruit. The miserable, half-starved piccaninnies gather and eat the fallen fruit ignorant of the fatal pink membrane. The old planters of the island, living among the people and knowing more of them than do the medical officers, can give some account of the frequency of this accident.

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Tropical Medicine and Hygiene

DECEMBER 15, 1906.

THE HOUSING OF EUROPEANS ON THE WEST COAST OF AFRICA.

IN the bad old times, which ended with the last century, the special plague spot of the West African town of Lagos was a certain marshy tract known to Europeans as the Kimberley swamp. Its position was such that it was obviously the most urgent danger to the health of the town, and its reclamation was the first great work of anti-malarial sanitation undertaken by that great and scientific administrator, the then Governor, Sir William MacGregor. During his only too short period of rule, anti-malarial sanitation was rigorously pushed, and the effects of his wise and effective action are shown more and more plainly every year in the health statistics of the colony, the deaths from malaria having fallen from 4 per cent. for the period 1897 to 1900 to 1.5 per cent. for the first five years of the present century. Since 1902, in fact, there has been only one fatal case of malaria, so that though there is undoubtedly much room for improvement; the benefits that have resulted from anti-malarial measures are absolutely beyond question, for the change from a pestilential mortality of 40 per *mille* from malaria alone to the comparatively moderate present death-rate was abrupt, and has been continuously maintained.

With such triumphant results, it might be thought that the policy so happily inaugurated by Sir W. MacGregor would be pushed and extended by any body of reasonable men, but this does not appear to be the case unless the following allegations can be called in question.

The Kimberley swamp was very properly converted into an open pleasure ground, but it should be needless to point out that it could never become suitable for an inhabited site, as the level of the subsoil water must necessarily always remain perilously near the surface, and the sanitary objections to the occupation of sites on made ground are so well known that such a course would never be permitted in the most backward municipality in England, and in the tropics, the dangers of such sites are many times multiplied. It appears, however, to be a fact that the Local Government have actually erected quarters for European officials on the edge of this site, and are contemplating building more. The avoidance of such situations is so much a matter of the A B C of sanitary science, that it is impossible to believe that the Government can have consulted their medical officers on the matter, as to do so would be to assume a degree of ignorance on the part of the latter that is quite incredible at the present day.

Further, the bungalows in question are absolutely unsuited for the purposes of tropical residence, being planned with the usual toy verandahs, which render the provision of adequate ventilation out of the question, as to do so would involve the admission of the direct rays of the sun to the rooms for a considerable portion of the day.

It may be taken as axiomatic that the verandahs of European quarters should never be less than 12 ft., and the more that can be afforded over this the better.

In a climate such as that of the West Coast, the first essential of health and comfort is a large roof area, and provided this be sufficiently extensive, the more nearly the house resembles a bird-cage the better. In any case, the walls should be placed so well inside the area of shade cast by the roof, that the sun can never shine directly on them after it is a few degrees above the horizon.

Given these essentials, it is easy to plan doors and windows of sufficient size to admit a pleasant and healthful current of air, in spite of the wire gauze mosquito guards, which we know to be an absolute essential of safety in a mosquito-ridden country.

An ideal residence should be protected with adequate gauze-guarded verandahs on all sides, but in any case, one verandah and the dining and sleeping room should be so provided, and the verandah enclosed with wire should be that on which the sun falls least throughout the year, so that it can be used for living and working in throughout the day, which is of course impossible in the absurd apologies for verandahs that are only too common on the "West Coast." But even worse remains, for, bad as malaria is, dysentery is worse, and dysentery is undoubtedly a water-carried disease. As in most parts of the West African littoral, the water supply is one of the most formidable dangers and difficulties in Lagos, the residents having to depend on surface wells. These wells are in no case above suspicion, and it is to be feared that the best is not made of them by adequate measures of protection;

but in the case of the new quarters in question, the wells have been sunk into the fathoms-deep organic filth of the old malarial marsh.

Of course, malaria cannot be conveyed in this way, but the consumption of such water is a well-known source of dysentery, and we shall be agreeably surprised if the unfortunate officials so supplied do not furnish a new instance of the danger of ignoring a commonplace of tropical sanitation.

It is wrong and immoral for any corporate body to subject its employees to needless risks, and if the local authorities do sufficiently realise this, surely a government which professes to concern itself so deeply with the housing of the working classes should step in and insist on the equally fair treatment for those who are bearing "the white man's burden" in our distant colonies and dependencies, by insisting on their being housed so as to be able to carry on their arduous and thankless duties under the best attainable conditions of health and therefore of efficiency. The reverse policy of stinting expenditure on the building of suitable and healthy quarters is, moreover, not even defensible from the financial point of view, as its penny wisdom inevitably results in a pound folly of needless ineffective charges to pay the salaries of officials on sick leave, who would have remained fit for work under a more enlightened *regimé*.

LIVERPOOL SCHOOL OF TROPICAL MEDICINE, MEMOIR XXI., SEPTEMBER, 1906.

The Runcorn Research Laboratories of the Liverpool School of Tropical Medicine.

These laboratories are situated at Crofton Lodge, Runcorn, sixteen miles from Liverpool, where stabling and pasture for all sorts of animals is obtained. An important function of the laboratories is to supply living parasites for the practical instruction of students taking the course in tropical medicine at the Johnston Laboratories, Liverpool. At Runcorn the various trypanosomes, spirochætes, the ticks *Ornithodoros moubata*, *Argas miniatus*, *Ixodes reduvius*, and *Rhipicephalus annulatus* are kept "a-going" and utilised for teaching purposes.

An Experimental Study on the Parasite of the African Tick Fever (Spirochæta Duttoni). By Anton Breinl and Allan Kinghorn.

The parasites experimented with were brought from the Congo Free State in infected ticks to Liverpool, and the strain was recovered from monkeys which had been infected through their bites. (1) It was soon shown that the spirochætes of tick differ from the *Spirochæta obermeieri* of relapsing fever, and the name *S. duttoni* was given to the tick fever spirochæte. (2) The technique of the experimental methods is given; and (3) a description of cases of African tick fever in whites. (3*a*) The experiments on animals show that the blood of patients suffering from relapsing fever is infective for susceptible animals during the periods of apyrexia. (4) A clinical comparison of African tick fever and European relapsing fever reveals the truth of Koch's statement that the attacks in tick fever are shorter than in the relapsing fever of Europe, and that the spirochætes are present in fewer numbers in tick fever. The length of intervals and the number of relapses in tick fever are not yet determined. (5) In experiments to determine animal reactions of *S. duttoni* it was found that monkeys, dogs, horses, goats, sheep, rabbits, guinea-pigs, rats, and mice were capable of inoculation. The most susceptible animals are white rats, and then monkeys. Of the monkeys, the order of susceptibility was as follows:—Young mona (*Cercopithecus mona*) and young Callithrix (*Cercopithecus callitrichus*) were most susceptible, followed by Rhesus (*Macacus rhesus*), "sooty" (*Cercocebus fuliginosus*), "Jew" (*Cercopithecus ?*), and baboons (*Papio anubis*); all the monkeys, with a single exception (a rhesus), became infected. In some animals the parasites were found only in the subinoculations. Cats were entirely refractory to infection. (6) *Chronicity.* Tick fever runs an acute or chronic course; in one case recorded the patient became ill in February, and the last relapse took place on April 22nd. (7) *Virulence.* No difference in virulence was noted in strains which had passed through a long series of animals, and that derived from animals directly infected through tick bites. The numbers of spirochætes in animals experimented upon varied directly with the number present in the inoculating blood. (8) *Immunity.* No satisfactory explanation has yet been given of the disappearance followed by a reappearance of the spirochætes in the blood. There was shown to be a relatively active immunity against reinfection, as animals reinoculated at various intervals after recovery up to seven and a half months did not become infected at all, or only had a very slight attack. Treatment by horse, monkey, and rat sera showed that hyperimmune serum derived from any one of these animals does not prevent the infection, but it positively lengthens the incubation period and mitigates the course of the disease when given in large doses. No cure was effected by the immune serum. Experiments show that there is a slight degree of inborn immunity, which speedily disappears, however. (9) *Specific nature of S. duttoni.* The spirochætes of African tick fever is of a species differing from *S. obermeieri*, since each confers a relatively active immunity against itself, and not against each other. (10) *Placental transmission.* The *S. duttoni* has been shown to pass through the placenta from the circulation of the mother to that of the fœtus, and that the majority of fœtuses carried by infected mothers are themselves infected. The parasites in the fœtus are fewer in number than in the mothers; they show no morphological change after gaining the fœtal blood, nor does the mother abort. An interesting observation noted was that although the infected fœtuses were born and lived, fewer reached maturity than in the case of healthy rats. (11) *The spleen in spirochætal infection.* (*a*) Experiments showed that the course of tick fever in animals from which the spleen had been removed does not differ from that noted in normal animals. The spirochætes appear in the peripheral circulation, increase in numbers to the maximum, then decrease and disappear from the blood. After an interval the

cycle is repeated. (*b*) It was shown that the spirochætes, when disappearing from the blood, do not rest solely in the spleen. (*c*) Spirochætes are present in the peripheral circulation in an infective stage on the first day after ticks are fed on a susceptible animal. (*d*) After recovery from the disease, animals subjected to splenectomy reacted in the same manner to reinoculation as did the controls. (12) An infective stage of *S. duttoni* is capable of passing through a Berkefeld filter, which does not allow the passage of *Bacillus prodigiosus*. (13) No definite conclusion has as yet been arrived at concerning the morphology of *S. duttoni*. (14) In experiments concerning the protozoal nature of spirochætes, Dutton and Todd state that the transmission of the spirochætes by ticks is not merely mechanical, and that some developmental process takes place in the tick. The passage of the spirochætes from the alimentary canal of the ticks to the ovary and eggs is interesting, and it has not been shown to occur in the case of any bacterium up to the present, but is known to occur with protozoa. (15) The animal reactions of *S. obermeieri* are quite different from those of *S. duttoni*, and, contrary to Novy and Knapp's statements that a relapse has never been seen in rats, Breinl and Kinghorn show that if the examination is continued for a sufficiently long period relapses do occur. (16) Animals which have recovered from infection by *S. obermeieri* acquire a certain amount of active immunity against reinfection, the efficiency of which corresponds directly to the severity of the attack.

Abstract.

Paratyphoid Fever and Typhoid Fever.

By Lieut.-Colonel D. B. Spencer, I.M.S.

Lieut.-Colonel Spencer, in a series of articles published in Mauritius (1906), deals with paratyphoid fever and enteric fever in India. He defines the ailment as follows :—

Paratyphoid Fever.—Definition.

Bacteriologically, judging from what I have read of the subject, I should say it is a fever caused by one or more members of the typho-coli group of organisms acting either singly or collectively ; that is to say, more than one organism of the typho-coli group probably take part simultaneously in the causation of the disease by a process known in bacteriology as symbiosis. But it must be clearly understood that this fever is not caused by the bacillus typhosus, the *causa causans* of true typhoid fever, for the Widal reaction, with a culture of the *B. typhosus*, is always negative in paratyphoid fever, and it is this fact which has drawn the attention of different observers in different parts of the world to this fever. It has been observed in America, England, Germany, France and India, so that the disease may therefore be said to have no geographical limits.

Bacteriology of Disease.

So far as I can gather from current literature on the subject it appears to me that paratyphoid fever is caused by the group of bacilli known as the Gaertner group, which occupy an intermediate position between the *B. typhosus* at the one end of the chain and the *B. coli communis* at the other end.

One of the most important organisms of this Gaertner group is the *B. enteriditis*, which is the bacillus usually associated, I believe, with meat poisoning and ptomaine fever, and it is this bacillus which is generally credited with being the cause of paratyphoid fever. According to Dr. Row, of Bombay, the *B. coli communis* is not an unimportant factor in the causation of paratyphoid fever.

Intestinal and Sewage Bacteria.

A large number of different kinds of bacilli have been isolated of late years from crude sewage, of which the following, I believe, are fairly well-known varieties :—*B. coli communis*, with about 150 varieties ; *B. cloacæ fluorescens*, *B. stercoralis*, *B. frondosus*, *B. fusiformis*, *B. subtilis*, *B. subtilissimus*, *B. mesentericus*, *Proteus cloacinus*, *Proteus vulgaris*, several other species of *Proteus*, *Micrococcus aurora*, *B. enteritidis sporogenes*, of which, according to Klein, there are from 500 to 600 spores per cc. of sewage ; then there are the thermophylic bacteria, of which there are some eight known varieties, and lastly we have the great streptococcus and staphylococcus families with their numerous varieties. These bacteria probably get into the human intestinal canal, for with every drop of water that we drink and with every particle of food that we eat, an immense number of bacteria enter the stomach, and although, fortunately for us, most of them are dissolved in the acid juice of the stomach, it is reasonable to infer that in the struggle to escape some of these bacteria find their way into the intestinal canal and are finally passed out with the fæces.

It is possible also that these same harmless organisms, under a new environment in the human intestinal canal, may have sometimes a share in the causation of paratyphoid fever by a process known as auto-infection or auto-intoxication from the intestinal canal.

In a paper on Paratyphoid, by two French doctors, Saquepée and Chevral, published lately in *La Presse Medicale*, the following statement occurs :—

"Two types are generally recognised, A and B. The cultures of A on gelatine, potato and agar resemble those of typhoid, while those of B are more luxuriant and recall coli cultures. Type A acidifies milk quickly and definitely (one to three days). Type B (alkalifaciens of School Muller) causes in the same media a transient acidity replaced later by a more pronounced alkalinity. Both types are very pathogenic to laboratory animals."

It will appear from the above description that paratyphoid bacilli, like the Gaertner group, occupy an approximately intermediate position between the *B. typhosus* and the *B. coli*, and they may therefore be said to be a branch if not a part of the Gaertner group.

Enteric Fever in India.

Why are the natives of India apparently immune to enterica ?

In this connection, I think, the chemistry of

ptomaines furnishes an important light. We know that these ptomaines are alkaloidal substances of the aromatic series of organic compounds, and that they are formed in the process of putrefaction of proteids or albuminoids derived from nitrogenous animal food, such as meat of any kind. We know also that meat is a regular article of diet for the British soldier, while in the native army a large number (Hindoo) never touch meat, fish, or eggs. Broadly speaking, the food of the British soldier consists largely of animal diet, that of the native soldier of vegetable diet (atta, rice, dal) and ghee, a carbohydrate. Again, beer is a common drink with British troops, and a British soldier can drink as much canteen beer as he likes. In the native army beer is unknown. Now beer is a thing which is very apt to ferment, especially in hot weather, and beer is drunk by British soldiers, in both hot weather and cold, without any restriction.

True Enterica.	Indian Enterica (A Fever with Enteric Symptoms).
Etiology. — *Bacillus typhi*, Eberths' associated with sewage contamination of food or drink.	*Etiology.* — Probably the *Bacillus coli* associated with fermentation and putrefaction of intestinal contents and consequent auto-infection.
Widal Test. — Positive reaction with the *Bacillus typhi.*	*Widal Test.* —Not known. (*a*)
Mode of incidence.—Usually in an epidemic form.	*Mode of incidence.*—Usually in a sporadic form.
Mortality per cent.—7·14 in the last Maidstone epidemic (Poole's Report).	*Mortality per cent.*—About 25 per cent. in India.
Chart.—Often typical. First week, gradual rise. Second week, high continued fever. Third week, gradual defervescence.	*Chart.*—Generally irregular.
Mode of onset.—Gradual.	*Mode of onset.*—Sudden or gradual.
Rash.—Generally present 88 per cent in the last Maidstone epidemic (Poole's Report).	*Rash.*—Generally absent.
Typhoid state.—Early and pronounced.	*Typhoid state.*—Often vague or altogether absent.
Abdominal symptoms.—Whether early or late they are unmistakeable.	*Abdominal symptoms*—Often absent.
Post-mortem appearances.—Typical ulceration of glandular structures of small intestine.	*Post-mortem appearances.*—Often the ulceration of intestine is irregular and extensive, being not confined to glandular structures.
Duration of fever.—Generally three weeks.	*Duration of fever*—Three to four weeks, but it can be aborted by a specific treatment. (*b*)
Treatment.—The recognised treatment has been an expectant treatment with intestinal antisepsis and irrigation (Burney Yeo).	*Treatment.*—The treatment I adopt is an eliminative treatment combined with intestinal antisepsis and irrigation.

(*a*) Now known to be negative.

(*b*) Instead of three to four weeks I should now say from two to eight weeks, or even longer.

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We have thus, I think, in meat and beer those elements of putrefaction and fermentation which are essential for ptomaine formation. The fact that enterica is so much more common in the hot weather than in the cold, *i.e.*, at a time when bacterial activity is greatest in the processes of decay, lends additional colour to this theory, and much of this striking difference in the rates of incidence of the disease between European and native troops is, I believe, due to a difference in diet of the two races.

Summarising the points dealt with in his paper, Lieut.-Colonel Spencer remarks in conclusion: It is, I think, difficult to believe that defective sanitation is the sole cause and the whole cause of enteric fever as seen in India. For, while on the one hand we can, in India, but seldom prove a causal connection between the disease and sewage contamination of food or drink, there is, I think, on the other hand, a vast array of positive evidence to show that a *fever with enteric symptoms*, closely simulating true enterica, (see tables) has been, and can be caused by other factors—factors which I believe are as yet not sufficiently recognised. Although spasmodic efforts have been made from time to time by a minority of original thinkers to show that they do exist, it may reasonably be asked whether, with our advancing knowledge of the subject, the time has not come for medical men in India, whatever may be their past or present convictions, to consider both individually and collectively the various points enumerated above. It is incumbent upon us to set to work to attempt to decide whether the disease we call "enteric fever" in India is always one disease arising from one cause only, or a complex disease presenting several phases and arising from a variety of causes; chief among these may be mentioned climate, food, and intestinal intoxication from fermentation and putrefaction of intestinal contents and the consequent formation of ptomaines and toxins therein of bacterial origin, though quite independently of the typhoid bacillus. For it must be obvious that, without correct premises, without a correct conception of the disease, and without an absolute unanimity among medical men as to what constitutes a correct conception of the disease, the inferences must be wrong and that there never can be any satisfactory solution of a complex and difficult subject like the enteric question.

Tropical Dysentery.—Abstract of paper in *Lancet*, of December 1, 1906, by Captain R. J. Blackham, D.P.H.R.C.P.S.Lond., Royal Army Medical Corps.

Amongst the diseases of special interest to the physician practising in the Tropics, the group of morbid conditions, known by the term of "dysentery," ranks only next in importance to enteric fever. Unfortunately, as Manson points out, our knowledge is not in proportion to the importance of the subject, and in the latest monographs on the disease it is evident that considerable doubt exists in the minds of eminent climatologists, who have made a special study of the malady, as to the exact boundary line between simple diarrhœa and dysentery. It is, however, only in very recent years that the difficulty of diagnosing dysentery has become appreciated, and a few years ago writers used to describe what is now considered to be a group of diseases as a well-defined malady and give its etiology, symptoms, and pathology in precise

terms. It would be well, therefore, to start by defining what we mean by "dysentery," and the definition suggested is that "dysentery is an inflammation of the large bowel, associated with pain, tenesmus, some slight pyrexia, and a large number of stools, consisting of mucus or mucopus, with micro-organisms but with or without blood." I think the last phrase is important, in view of Dopter's work during the past year, and the evidence which he has submitted that simple diarrhœa may be an abortive form of dysentery, and that all cases of acute diarrhœa occurring where dysentery is prevalent should be regarded as suspicious, and, where possible, bacteriological methods resorted to for diagnosis in preference to the rough-and-ready test of the character of the stools.

In the classification of the varieties of dysentery much difficulty and confusion of ideas have arisen, and as Firth points out, "it is doubtful whether the literature of any disease is more encumbered with a mass of names indicating the nature of the disorder or the author's conception of its pathology than is that of dysentery." Terms founded on a pathological basis such as "catarrhal," "ulcerative," and "gangrenous" have been passed on from text-book to text-book and are used by Manson, Scheube, and even such a recent text-book on pathology as Stengel's (p. 547), and in an article just published in the *Lancet*, but as was pointed out by Taylor as far back as 1901, the "disease is essentially the same in all varieties." Such terms merely indicate clinical conditions found in the various stages of a single pathological process, and it would be well, therefore, to dismiss this older classification and adopt the one now used by Osler, namely, (1) amœbic dysentery; and (2) bacillary dysentery. This nomenclature was, I think, first suggested by Davidson, but he added to it a third variety, which does not really exist, as his "dysentery of war" is simply a form of bacilliary dysentery.

Causes of Dysentery.—In considering these we must sub-divide the heading into (*a*) predisposing causes; and (*b*) exciting causes. Let us first consider the causes which predispose to the disease. We find that these fall under four chief divisions, namely, (1) age, (2) sex, (3) occupation, and (4) conditions of lowered vitality.

(1) Age.—Dysentery may occur at any age, but in my experience it has a singular predilection for the extremes of life, children and old people being peculiarly liable, the former, doubtless, on account of their well-known liability to catarrh of the intestinal mucous membrane which is itself a predisposing cause of the disease, according to Scheube (p. 466).

(2) Sex.—According to most authorities this does not exert any influence, but Scheube cites pregnancy as a predisposing cause, and it is within the experience of most physicians who have lived in the Tropics that when dysentery occurs in a pregnant woman, or during the puerperium, the prognosis is very grave indeed.

(3) Occupation.—Davidson asserts that agriculturists are attacked more frequently than persons whose calling is carried on indoors, and according to Lancarol persons who labour in the heat, such as stokers, cooks, and mechanics, are peculiarly liable to disease.

(4) Conditions of lowered vitality.—There can be no doubt that in conditions of health the pathogenic organisms of dysentery, enteric fever, cholera, and other diseases pass through the intestinal tract in association with the luxuriant flora and fauna which normally flourish therein, without causing any inconvenience, and that it is only when the mucous membrane of the bowel is the subject of some inflammation, irritation, or impaired nutrition that it forms a suitable nidus for the *Amœba* or *Bacillus dysenteriæ*.

Such conditions of reduced vitality may be induced by a variety of circumstances, first and foremost among which I would place "chill," which Manson declares to be a "powerful excitant of dysentery," and Scheube considers, above all things, to be mentioned as a predisposing cause. Next I should place "unfavourable hygienic conditions," such as overcrowding, contamination of the soil with sewage, and an impure water supply. Epidemics of the disease are therefore peculiarly likely to occur in war and as an accompaniment of famine, and Scheube says, "In almost every long campaign or siege the outbreak of an epidemic of dysentery amongst the combatants, amongst the besiegers as well as the besieged, is a common occurrence."

Amœbic Dysentery.—This variety is essentially slow developing in its nature, although acute attacks are not uncommon. It is styled by Firth and others "endemic dysentery," and it appears to have little tendency to break out into definite epidemics, as is the case with the other form of dysentery. An amœba was first described by Lambl in 1859 and subsequently by Löseh in 1875, but to Schaudinn is due our present exact knowledge of the genuine organism. He found that many kinds of amœboid organisms occur in the human intestine and that some of these are not true amœbæ at all but merely amœboid stages in the development of the higher forms of the protozoa such as trichonomas, lamblia, and other infusorians. Genuine amœbæ he divided into two classes: (1) those provided with a shell, the thecamœbæ; and (2) those that have no other covering, or gymnamœbæ. "At least one of the former and two of the latter sort are now known to occur in the intestine." The two naked forms are genuine parasites, but one of them is harmless and the other one of the most dangerous of pathogenic protozoa. Schaudinn has re-named the former, hitherto known as the *Amœba coli*, *Entamœba*, and the latter, hitherto known as the *A. dysenteriæ*, as the *Entamœba hystolytica*. The *E. coli* was found in from 20 to 60 per cent. of healthy stools by Schaudinn and is a shapeless mass of protoplasm not showing much differentiation into ecto- and endoplasm but possessed of a well-marked nucleus. It is difficult to find in healthy fæces, as its habitat being in the upper regions of the colon it dies out as the intestinal fæces become firmer on their passage down the bowel. If, however, the downward course of the fæces is hurried by saline purgatives the amœbæ can be readily detected, as Schuberg has shown. "The amœbæ have two distinct cycles of development; one vegetative or asexual, taking place in the naked state, the other displaying a

primitive but unmistakeable form of sexuality and occurring inside of a capsule resembling an egg-shell and termed a cyst. In the vegetative form the amœbæ either simply split in two or their nucleus divides into eight daughter nuclei, each of which takes a portion of the protoplasm so as to form a characteristic brood of eight young amœbæ, which come apart. In the other or sexual cycle the amœba rounds itself off, comes to rest, and contracts and surrounds itself with a gelatinous coat which becomes the cyst wall. The two nuclei, after undergoing reconstruction and chrosmosomic reduction, divide into halves, which copulate, so as to form two fresh nuclei, each containing half of the two parent nuclei. Each of these copulation nuclei now divides twice and the divisions form eight young amœbæ which, however, cannot leave their cyst until it has been taken in by a new host and has had its wall softened in the stomach and duodenum." The pathogenic *E. hystolytica* differs materially from the foregoing. It possesses a tough ectoplasm which enables it to force its way between the layers of the mucous membrane and produce the undermined ulcers of tropical dysentery. Schaudinn has actually observed the organism in scrapings of the bowel from an experimentally infected cat. "The two sorts of amœba differ also in their reproduction. The pathogenic form in its vegetative stage divides into two, or forms new individuals by budding. Brood formation does not occur. The process of encystment is also quite different. It comes on when the patient is beginning to recover from his attack of dysentery and the fæces are becoming solid. The nucleus gives up most of its chromatin in granular form to the plasma and its remains are expelled. The plasma now projects from its surface a number of little knobs, each containing a particle of chromatin and measuring from three to seven micra in diameter. These break off after a while and each becomes surrounded by a capsule which ultimately becomes quite brown, hard, and opaque. These 'spores' are then expelled with the fæces and serve to infect a fresh host."

McWeeney states that so far back as 1902 he believed that the *A. coli*, or rather, I presume, what we now know as the *E. histolytica*, was causative of one form of dysentery, and in the very excellent paper from which I have quoted above he holds that "one of Schaudinn's experiments seems quite conclusive." In this experiment this great investigator, whose untimely death we all deplore, dried a small quantity of fæces from a case of undoubted dysentery in air, and satisfied himself microscopically that it contained no cysts of *E. coli*, but only the small brown spores of *E. histolytica*. The cover-glasses were then removed from the slides actually examined, and the fæces washed off with about one cubic centimetre of sterile water and administered in food to a young cat whose stools had been proved to be free from amœbæ. Three days later the cat began to pass slimy fæces streaked with blood. These were found to be swarming with typical *E. histolytica*. Next day the animal died from dysentery. The necropsy showed characteristic ulceration of the large intestine with crowds of amœbæ in all stages of penetration into the intestinal wall. Schaudinn administered quantities of the fæces of this cat to another, but it remained healthy. He then gave a small quantity of the dried fæces originally used, and within six days amœbæ appeared in the fæces. This cat, which was older and stronger than the first one, developed dysentery, and "died in about a fortnight" From this experiment it would appear that amœbæ taken by the mouth appear to be harmless, and that "it is to the dried-up, cyst-containing fæces present in dust and water that we must look for the propagation of dysentery."

Bacillary Dysentery.—Although it is evident from the foregoing that the *A. dysenteriæ* is clearly the exciting cause of many cases of dysentery, it is equally evident that there is a very large amount of dysentery which is not due to amœbæ. In support of this we find that Bruce, Washbourn, and Birt failed to find amœbæ at all in the large number of cases they examined during the South African epidemics. Major W. W. O. Beveridge discovered amœbæ in only three out of 147 cases examined in the Army Medical Service laboratories at Pretoria. Strong and Musgrave noted 766 cases of bacillary to 561 of amœbic dysentery in their investigations in Manila, while Rogers states that the bacillary is much the most common form of the disease in Calcutta. The credit of first recognising a definite bacillus which was capable of producing dysentery is due to Chantemesse and Widal, who showed by experiments on animals that a bacillus closely allied to the *B. coli communis* was frequently present in the stools of epidemic dysentery, and capable of producing the disease in cats; but the question of the exact form of bacterium responsible for the disease was hotly disputed until Shiga, of Tokio, isolated a bacillus from the type of disease occurring in Japan, and "proved its specificity by demonstrating the agglutination of its cultures by blood serum."

Prevention of Dysentery.—(1) General. Scheube states that the general prophylaxis of dysentery demands careful attention to general hygiene and the personal avoidance of the predisposing causes, and goes on to say "The circumstance that dysentery does not now appear in the tropics with the same frequency and severity of thirty or forty years ago is to be ascribed to the improvement in hygienic conditions, especially in regard to water-supply, which has taken place during recent years and to the more rational method of treatment practised by the doctors of the present day. In order to prevent the disease spreading the intestinal evacuations should be disinfected, as should also night commodes, utensils, privies, &c., as well as the soiled linen and bed-linen used by the sick." He further recommends that when constipation occurs in the East only mild aperients should be taken, and quotes, without comment, the advice of Lancarol to take cold baths throughout the year as a prophylactic. To prevent dysentery in the tropics I would suggest that the following rules be strictly adhered to, and that, having themselves grasped their importance, all officials should be induced, by precept and practice, to enforce obedience to this simple code on their subordinates. (1) Drink only boiled or preferably sterilised water, by which I mean water not bacteriologically sterile but which has been

heated to 80° C., a temperature which is sufficient to kill non-spore-bearing organisms and certainly the bacteria of dysentery, cholera, enteric fever, and most other communicable diseases. (2) Clothe warmly, and wear a so-called cholera-belt to avoid chill being communicated through the abdominal wall to the intestine. (3) Be temperate in food and drink, and remember that alcohol is a luxury and not a necessity of life, especially in the tropics. (4) Seek medical advice at once when constipated or suffering from diarrhœa, however mild in character, and avoid drastic cathartics. (5) Isolate all cases of dysentery rigorously, regard cases of diarrhœa occurring during epidemics as suspicious, and disinfect with care all diarrhœic stools and the bedding and clothing of all persons affected with dysentery or suspicious diarrhœa [15].

Treatment of Dysentery.—We are confronted at the outset with a serious difficulty. We find that the treatment of the two varieties of the disease is hopelessly mixed up by each and every authority, even in the most recent articles on the subject such as that of Dr. C. B. Sheldon Amos, and that it is almost impossible to differentiate the remedies which are to be recommended in the variety due to amœbæ from those suggested for the bacillary type of the disease. As, however, it must frequently be impossible in practice to decide the type of disease at the outset of treatment it will, I think, be best to discuss the therapeutical measures available as a whole and merely to divide our remarks under the classical headings of "acute" and "chronic."

The indications which will assist us in the treatment of dysentery are five in number: (1) To relieve the pain and tenesmus; (2) to avoid all irritation of the inflamed mucous membrane; (3) to promôte intestinal antisepsis by removing foul accumulations and arresting putrefaction; (4) to counteract any morbid agency in the blood as far as may be; and (5) To support the patient's strength by suitable diet. Let us consider these indications.

Firstly, to relieve the pain and tenesmus.—As the use of opium has been unhesitatingly condemned by the older writers in the treatment of acute dysentery, the evidence of Washbourn and Faichnie is of value as expressing the most recent views on the subject. Washbourn goes so far as to say that he has seen lives saved in South Africa by the introduction of a morphine suppository, so there is now no doubt that the first indication of the treatment of acute dysentery is to give opium in some form or other, not to act as an astringent but simply to moderate and control the painful contraction of the intestines which produces what is known as tenesmus.

Secondly, to avoid irritation of the inflamed mucous membrane. In this relation I may point out that many years ago Sir William Gull summed up the treatment of acute dysentery in three words, viz: "Rest, warmth, and ipecacuanha." This was not only smart and epigrammatical but it had the advantage of being correct, and Washbourn after his exceptional experiences in South Africa, has little to add to the aphorism of the great Gull. To avoid irritation of the inflamed mucous membrane we must apply the first two of Gull's trinity of remedies. Rest is absolutely essential, and in all cases the patient should remain in bed and use a bed-pan. All foods which leave a residue prone to decomposition must be avoided, and Manson objects even to milk in acute dysentery if the tongue is foul, and limits the diet to weak chicken broth, barley, and rice water, with a little egg albumen till the tongue cleans. Milk is, however, considered the best food in all cases by Scheube and Yeo, while Osler recommends "milk, whey, and broths."

The third indication for treatment is to attempt to produce intestinal antisepsis. This can, of course, be merely an attempt, as the bowel may be regarded as a forest crowded with flora and fauna of the most varied and septic character, but although it may be useless to try to render the mucosa aseptic, it may be possible to place it in a position which will discourage the growth of a delicate organism such as the bacillus of dysentery appears to be. There are three ways in which we may attempt to treat this indication—namely: (1) by saline aperients which sweep all foul accumulations and organisms from the intestinal tract in a more or less mechanical manner; (2) by the administration of certain drugs said to be specific; and (3) by washing out the bowel per anum by means of astringent and antiseptic fluids. In the tropics the best preliminary treatment for all kinds of diarrhœa is a dose of castor oil with or without from 15 to 20 minims of liquor opii sedativus, and Manson believes that slight cases of dysentery are often checked thereby and require no further treatment except rest and a bland non-irritating diet for a few days. Having done this the physician must elect whether he will resort to the saline, specific, or lavage method of treatment.

"Specific" Treatment.—Scheube says: "The principal drugs used in the treatment of dysentery are calomel and ipecacuanha, the effects of which do not depend solely on their aperient and emetic qualities. The drugs must be regarded as having a 'specific' effect, a fact which does not seem as yet to have been fully acknowledged, at least as far as German text-books are concerned." Manson says he can offer no explanation of the action of any drug in dysentery, and admits that we use them empirically, but thinks that "ipecac. and simaruba really seem to have some sort of specific action on the disease or its cause, but in what way it is impossible to say." Yeo thinks that ipecacuanha may be microbicidal and arrest the growth of the organism, whether amœba or bacillus, producing the disease, while Fayrer points out that the mortality of all varieties of dysentery in India, which was 11 per cent. before its use, fell to 5 per cent. after its introduction. The method of exhibiting the drug almost universally adopted in military practice in India, is to interdict food for three hours and then to give 20 minims of liquor opii sedativus in a small quantity of water. Half an hour after the opium 30 grains of powdered ipecacuanha are given in the form of freshly prepared pills or as a bolus. To prevent vomiting the patient is directed to lie perfectly still in a darkened room and not to drink, speak or move for three or four hours. He must be cautioned not to swallow his saliva, and a nurse should remain by his side with directions to wipe away any salivary secretion on the slightest indication from the patient.

Ipecacuanha prepared without the emetic principle was much vaunted at one time, but its use was abandoned by most Indian practitioners before the South African war, when it was extensively used and found most unsatisfactory. I believe Day's remarkable experience of the failure of the drug to cure dysentery was due to his using this preparation He reported sixty cases, in twenty-six of which he used ipecacuanha *sine emetina* and opium, with the result that nine died, and thirty-two in which he administered sulphate of magnesium with only one death.

The Lavage Treatment.—Osler says "that the treatment of dysentery by topical applications is by far the most rational plan," but I think this statement requires qualification. It is unquestionably a valuable method of treatment, but it is only applicable in subacute and chronic cases, at least in the tropics, where the services of skilled nurses are comparatively rarely obtainable. I merely refer to this method for the sake of completeness, as the results of the two previous lines of treatment are so good. For instance, Buchanan has treated 855 consecutive cases by salines, with only nine deaths, giving a case mortality of only 1·05, and these, I think, are almost as good results as can be hoped for in the treatment of an acute illness.

The fourth indication is to counteract any morbid condition of the blood. This is a most important indication, and one which has recently attracted much attention. Where dysentery occurs in a malarial subject quinine must be exhibited in full doses, and Maclean goes so far as to recommend that 20 grains of quinine should always be administered before the ipecacuanha treatment is begun. The morbid condition of the blood which has recently been shown to be frequently associated with dysentery, especially on the Indian frontier, is, however, diminished alkalinity, which Wright has shown to be a frequent cause of scurvy. It must, therefore, be borne in mind that a condition resembling ordinary dysentery may be simply a variety of scurvy, and it may be well, therefore, to test the alkalinity of the blood by the method advised by Wright in all cases of dysentery in which the origin is obscure. Recently in Somaliland a succession of cases of dysentery were found to be due to "acid intoxication," and were relieved by anti-scorbutic treatment.

The fifth and last indication is to maintain the patient's strength. This must be done by suitable diet, as indicated under our second heading, and the administration of stimulants in some cases, but not as a matter of routine. Few will agree with Yeo's suggestion that port and burgundy may be used in acute cases, and the custom of most physicians in the tropics is to prescribe brandy or champagne in the comparatively rare cases in which alcohol is necessary. "Ether and caffeine hypodermically and saline injections have been employed with success in cases in which life appeared to be endangered by hæmorrhage and anæmia with prostration and collapse." Sparteine has also been used with success. After the very acute stage is over, and when the appetite is returning, the strength must be supported by a fairly liberal diet. Egg-and-milk flavoured with nutmeg is an agreeable and nutritious food. Pounded sweetbread, chicken or mutton may be given, with strong soups, and the many varieties of bland farinaceous food of which rice and bread are the types.

The Treatment of Chronic Dysentery.—We now turn to the treatment of chronic dysentery, a condition all too familiar to physicians who have practised in the East. The indications requiring treatment are here merely three in number: (1) to promote a restoration of the diseased mucous membrane; (2) to counteract any morbid tendency in the blood; and (3) to support the patient's strength by proper diet.

(1) Manson's routine in treating all cases of chronic dysentery, a method of which I have had some personal experience, is to give a short preliminary course of ipecacuanha—30, 25, 20, 15, 10, and 5 grains on successive evenings, with rest in bed and milk diet. He then proceeds to give a short course of very small doses of castor oil, with or without opium, three times daily, regulating the dose according to the amount of action produced. If this treatment does good he proceeds to give a mixture of simaruba and cinnamon, with or without some intestinal antiseptic, such as salol or B-naphthol. These measures failing, he has to resort to direct topical applications. Osler and Manson are agreed that these are of the utmost value in the treatment of dysentery, but on one important point the two great authorities differ. The latter insists that topical remedies should never be applied when acute symptoms are present, whereas the former gives the technique for their use in the acute stage of the disease. Nitrate of silver injections are now considered by most authorities to be the best form of local application in chronic dysentery, but solutions of quinine are strongly advocated by Osler in amœbic dysentery, this being with one exception the sole instance in which a remedy peculiar to one type of dysentery is advocated by any of the authors I have consulted.

Recent Bacteriological Investigations.—For the purpose of this paper I obtained the following strains of *B. dysenteriæ*—(1) Shiga's bacillus, I.; (2) Shiga's bacillus, II.; (3) Flexner's bacillus; (4) Vaillard's bacillus; (5) Kruse's bacillus; and (6) *B. dysenteriæ* (non-pathogenic). For the first of these cultures I am indebted to Captain Harvey, assistant professor of pathology, and for the remaining five to Major Fowler, assistant professor of hygiene at the Royal Army Medical College, London. To economise space I have arranged the morphological and cultural characteristics of the various bacilli in the accompanying table, which shows clearly their resemblance to, and difference from, the other members of the coli group of micro-organisms.

Conclusions.—(1) I think that we may take it as bacteriologically proven that notwithstanding slight cultural differences the various strains of bacillus dysenteriæ isolated by Shiga, Flexner, Vaillard, Harris, and Firth are simply varieties of the same organism. Bruce's "G Bacillus" resembles them, but I have not included it in my limited observations, as it was isolated from a single case, and when it arrived in England it was almost dead and had to be revivified by prolonged recultivation. In addition to these pathogenic strains of the organism there are several varieties of so-called pseudo-dysentery bacillus which are non-pathogenic and are to be distinguished from the true bacteria of

TABLE SHOWING THE MORPHOLOGICAL AND CULTURAL CHARACTERISTICS OF BACILLUS DYSENTERIÆ AND THE ALLIED GROUP OF MICRO-ORGANISMS.*

Micro-organism	Character	Motility	Flagella	Growth on nutrient agar	Gelatin stab	Peptone and salt	Neutral red shake	Litmus milk	Sterile potato	Agglutination with dysenteric serum.
Shiga's *B. dysenteriæ* I.	Short rod with rounded ends. No spores. Length 1–3 μ	Motile in recent cultures from stools. Gradually loses motility in sub-cultures.	2–6. Mostly terminal. Rather short and thick.	Semi opaque. Resemble the growth of *B. typhosus*, but are more transparent	Similar to *B. typhosus*, but film which spreads out from puncture usually absent	Faint haziness which rapidly clears. No indol	No appreciable discharge of colour	Becomes feebly acid. After 4 days' incubation acidity has been estimated as equal to 6 per cent. decinormal alkaline solution. No clot	Transparent or whitish growth, which becomes brownish red or dirty grey, with discolouration of potato at edge in a few days	Usually only agglutinates with serum from animal immunised by special strain of *B. dysenteriæ*
Shiga's bacillus II.	ditto	ditto	ditto	Has a characteristic odour called by the Germans "Sperm-geruch"	Growth not seen till 48 hours, and then only slight white growth	ditto	ditto	ditto	ditto	ditto
Vaillard's bacillus	Shorter than Shiga's, otherwise similar	ditto	Numerous fine, reticulated, very long and readily seen (Birt).	ditto	ditto	ditto	ditto	ditto	ditto	ditto
Flexner's bacillus	Similar to Shiga	ditto	Long, thick, and terminal	ditto	ditto	ditto	ditto	ditto	ditto	ditto
Kruse's bacillus	ditto	ditto	Usually 2 terminal	ditto	ditto	ditto	ditto	ditto	ditto	ditto
Pseudo-dysenterial bacillus	Generally somewhat larger than true dysentery bacillus	ditto	Variable	ditto	ditto	ditto	ditto	Slightly acid at first. Afterwards slightly alkaline	ditto	Very variable
B. typhosus abdominalis	Longer than either *B. dysenteriæ* or *B. coli*. "Oval ends" (Muir and Ritchie).	Sub-cultures always very motile.	8–12	More opaque than those of *B. dysenteriæ*	Similar, but surface film usually present.	ditto	ditto	Slight acidity after some days	For several days apparently no growth. Later slight pellicle with velvety surface.	*Nil*
Paratyphoid bacilli	ditto	Not so motile as *B. typhosus* but more so than *B. coli*	Variable	ditto	ditto	ditto	A, usually no change. B, sometimes fluorescence	Paratyphoid A produced acid like *B. typhosus*, and Paratyphoid B produced alkali	Variable	*Nil*
B. coli communis	Shorter and thicker than *B. typhosus*	Motility is not so marked as *B. typhosus*	2–6	More opaque than *B. typhosus*.	Whiter, thicker, more opaque, and showing gas bubbles	Indol production marked	Canary yellow colour produced and gas bubbles	Marked acid and clot	In 48 hours distinct brownish film which rapidly spreads and becomes thicker	*Nil*

* In addition to the culture media and other tests shown in the table the effects of Gram's stain, bile salt broth, mannite nutrose broth, raffinose nutrose medium, salicine nutrose medium, caffeine medium, and agglutination with enteric fever serum were also tried. The effects were as follows. *Gram's stain:* "decolourised" with all nine bacilli. *Bile salt broth:* "acid, no gas" for the first eight bacilli; "acid and gas" for the *B. coli communis*. *Mannite nutrose broth:* "unchanged" for the first five bacilli; "growth and acid" for the pseudo-dysenterial bacillus; "acid" for the last three bacilli. *Raffinose nutrose medium and also salicine nutrose medium:* "acid and growth" for the pseudo-dysenterial bacillus; "unchanged" for the other eight bacilli. *Caffeine medium:* "growth" with the *B. typhosus abdominalis* and the Paratyphoid bacilli; "no growth" with the other seven bacilli. On testing with enteric fever serum the agglutination result was "marked" with the *B. typhosus abdominalis* and "*nil*" with the other eight bacilli.

dysentery by the fact that they act on carbohydrates unaffected by Shiga's and the other pathogenic bacilli and they fail to produce enteritis in animals. Whether, however, these bacilli represent degraded or transitional forms of the true bacillus it is, as yet, impossible to say, (2) That symptoms and intestinal lesions identical with those found in man supervene after the subcutaneous inoculation of rabbits with the cultures of the various strains of *B. dysenteriæ*. (3) That the dysentery organsism have considerable vitality. They will live on clothing for at least three weeks and are said to maintain their virulence in damp soil for months. When spread on bread crumbs, or similar articles of food, they survive for about a week. (4) They are, however, very readily destroyed by heat or by weak solutions of perchloride of mercury or the higher phenols. (5) The specific agglutination reaction with the serum of persons suffering from acute dysentery can generally be obtained within two weeks following the onset of symptoms, but is often poorly marked. It is, however, of some value, and the blood of all patients suffering from a prolonged attack of diarrhœa should invariably be tested with several strains of the bacillus, and the stools subjected to a microscopical examination, as my chief desire in this paper is to call attention to the fact that the character of the stools alone is not to be considered as the test of the presence or absence of dysentery.

I think the most important lesson to be drawn from my investigation of the literature on this subject, and my very limited bacteriological work with the organisms of dysentery, is that the profession has only begun to realise its ignorance of a very great subject and that the clinical entities, which we have hitherto styled dysentery, are not one disease but a group of maladies of very varying degrees of severity, ranging from the acute dysentery so familiar to those of us who have served in India or South Africa, to the simple infective diarrhœa which occurs in infants and adults. Simple diarrhœa may be, and often is, an abortive form of dysentery, as has been shown by the work of Dopter and Jurgens during the early part of 1905. During an epidemic of dysentery there are always a number of cases which are in reality dysentery, but because no blood appears in the stools are regarded as simple diarrhœa, and it is these cases which constitute a grave source of danger to the community, as they may infect others and give rise to attacks of true dysentery. Jurgens has recently examined the stools of twenty-five cases of simple diarrhœa which occurred during an epidemic of dysentery in a camp at Gruppe. He failed to recover the *B. dysenteriæ*, but the serum of one of the cases agglutinated with a strain of the organism. Dopter examined bacteriologically the stools of eleven cases of diarrhœa occurring during an epidemic of dysentery last spring. Seven of these cases were very mild; the *B. dysenteriæ* was, however, recovered from one of them, but the serum reaction in all of them was negative. The remaining four cases did not yield to ordinary treatment and ran a prolonged course, but only symptoms of diarrhœa were observed and no blood appeared in the stools. In one of these cases the *B. dysenteriæ* was isolated, but in all the serum reaction was positive,

In the light of this recent work I submit that all cases of diarrhœa occurring in the tropics should be treated with the same precautions as if they were manifest cases of dysentery, and in hospital should invariably be isolated and their stools sterilised in some simple form of steriliser, or by means of disinfectants. In the Indian hills all fæcal matter should be received on pine needles, and burnt as suggested by me in a communication to the *Journal of the Royal Army Medical Corps*, entitled "The Goux System and its Application to India" (vol. vi., p. 662). If acute diarrhœa and dysentery were recognised in the service as infectious diseases, promptly isolated, and careful disinfection of clothing, bedding, and stools carried out, I believe we should hear less of epidemics of dysentery both in tropical countries and on active service. The Japanese have shown us a good example in the recent war, as they fully recognised dysentery as a communicable disease with, we are told, the happiest results. In conclusion, I maintain that if we can in future warfare secure for His Majesty's troops a pure, or at least, an innocuous, water-supply, an intelligent conservancy, and the prompt recognition and isolation of suspicious cases of diarrhœa, we can confidently hope for comparative immunity from the fell disease, or rather diseases, which have been the scourge of all armies in the field since the day of Agincourt.

Reviews.

A Japanese Text-Book on Plague. By Dr. Tohiu Ishigami, Superintendent Bacteriological Institute, Osaka, Japan; formerly Assistant Bacteriologist to Professor Kitasato. Revised by Professor Shibasaburo Kitasato, Tokyo, Japan. Translated, enlarged and illustrated with Pathogenic Horticulture by Donald MacDonald, M.B., C.M. (Glasg.), late Consulting Bacteriologist to the S. Australian Government. 152 illustrations. 3 plates. (Adelaide: Vardon and Pritchard, Gresham Street, 1905).

Part I.

This text-book is written by one who has closely studied plague in all its bearings. Dr. Ishigami was a member of the Japanese Commission which visited Hong Kong when plague appeared there in 1894 under the leadership of Professors Kitasato and Aoyama. His training in the clinical and bacteriological features of plague was thorough, and he has given us a text-book which is characterised throughout by judical statements, accurate details and many suggestions of an eminently scientific nature as to the means by which the plague is spread. The prophylaxis of the disease is dealt with in a manner which must commend itself to everyone who has studied plague. One of the most interesting parts of the book is that relating to the plague bacillus itself. The question of involution forms of the bacillus, whereby much confusion has arisen in the matter of diagnosis, is clearly stated by Dr. Ishigami. It so often occurs that bacteriologists hesitate to pronounce the disease to be plague, because they meet only with involution forms, that a careful perusal of the paragraphs dealing

with the matter should prove instructive and convincing. At pages 6 and 7 we find: On the first day Professor Kitasato examined the blood of the heart, spleen, liver, lungs, and swollen lymphatic glands of a corpse dead from plague. He found in them a considerable number of strangely original rod-shaped bacilli. On the same day microscopic examinations of the blood obtained from the finger tips of a critical patient revealed the existence in it of similar bacilli.

Subsequent bacteriological examinations of several patients and corpses demonstrated the presence of the same bacillus in every case. But those existing in the blood were regular in shape and smaller, whilst those in buboes or swollen glands and other organs were irregular in shape, and somewhat larger. Both were found to exhibit bipolar staining, the middle part refusing to retain the dye. The cultures made from both varieties were similar in the shape and appearance of their growth. Therefore, Professor Kitasato was of the opinion that those which existed in the glands and other organs were pleomorphic involution forms, and, following a fundamental principle of pathology, attached greater importance to those existing in the blood. Hence he conducted a series of cultivations and experiments on animals, the results of which were made public as explaining the cause of the disease.

A few days after this discovery of Professor Kitasato's, Dr. Yersin, of France, sent out from the Pasteur Institute, arrived at Hong Kong *viâ* Saigon. Conducting his investigations independently of Professor Kitasato, he studied the bacilli chiefly as met with in the glands and organs, which we had considered to be involution forms.

He reported the results of his investigations to the Pasteur Institute as the cause of the disease. Since then, Professor Aoyama has made a special microscopic study of specimens of organs and glands from the plague corpses which have been brought from Hong Kong. He gave out as the result that the bacillus which exists in the glands, and which is decolourised by Gram's method, is an entirely different species to that which exists in the blood, and which is not decolourised by Gram's method.

Part II.

"Plague Pathogenic Horticulture" is contributed by Dr. MacDonald, to which is added a lecture on Plague and "Two Dozen Anti-Plague Golden Rules." The rules are as follows:—

Remember, plague is more "Death" than disease.
Never visit suspected or plague-stricken houses.
Never alter a well-regulated diet.
Wash the hands frequently.
Avoid excesses in diet and wines.
Cook food well and preserve from insects.
Heat serving plates to a high temperature.
Cooking utensils wash with boiled water or water of undoubted purity.
Rather drink weak tea than suspicious water.
Avoid excess in exercise and bathing.
Never handle dead rats.
Destroy your vermin.
Never neglect a trifling wound, cold, or dyspepsia.
Protect the lower limbs well.
Be vaccinated and re-vaccinated if you can.
Keep good fires in winter.
Avoid wet feet.
Preserve the head with sunshades in summer.
Use if you can the mosquito net.
Never exchange pipes.
Never kiss the plague suspect.
Avoid plague apparel unless fumigated.
Never fear, rather be cool, calm, and collected.
Remember cleanliness is next to godliness.

The text-book is fully illustrated and is a valuable addition to plague literature.

Personal Notes.

Indian Medical Services.

Arrivals Reported in London.—Lieutenant-Colonel J. Smyth, Major V. C. Drake Brockman, Major J. A. Hamilton, Captain J. H. Horton, Captain J. L. Robertson, Captain H. Ainsworth.

Extensions of Leave.—Lieutenant-Colonel R. J. Baker, study leave, from April 23rd to June 23rd, 1906, and October 8th to November 8th, 1906; Major T. W. A. Fullerton, furlough to July 1st, 1907; Major C. E. L. Gilbert, three month's furlough; Captain D. S. Baker, one month's furlough.

Permitted to Return to Duty.—Lieutenant-Colonel W. B. Browning.

Postings.

Captain M. Mackelvie and Captain F. P. Connor, services placed at disposal of Government of Bengal.

Lieutenant-Colonel H. Hendly is appointed Civil Surgeon, Kurnal.

Lieutenant F. J. Baley, I.S.M.D., officiates as Civil Surgeon, Singh Bhum.

Military Assistant Surgeon F. G. Cutler, I.S.M.D., is appointed Assistant to the Civil Surgeon, Jubbulpore and Nupt.

Assistant Surgeon J. Robertson, I.S.M.D., officiates as Civil Surgeon, Yeoltmal.

Captain F. T. Thompson, to the Medical Charge 11th Lancers.

Lieutenant Colonel J. Morwood, to be Civil Surgeon, Sultanpur.

Dr. E. J. Simpson, uncovenanted Medical Service, to be Civil Surgeon, Jalaim.

Assistant Surgeon E. Phillips, I.S.M.D., to officiate as Civil Surgeon, Hoshiarpur.

Lieutenant Colonel A. Coates, resumes charge of the duties of Professor of Midwifery and Forensic Medicine, Medical College, Lahore, and Medical Officer in charge of Government College.

Leave.

Major D. T. Lane, private and study leave 12 m.

LIVERPOOL SCHOOL OF TROPICAL MEDICINE.

Yellow Fever Expedition.

The members of the Yellow Fever Expedition from Liverpool, which commenced research work on yellow fever in Brazil in 1905, still continue their investigations. It is satisfactory to know that the medical members of the expedition who were attacked by yellow fever have quite recovered from their illness. A telegram was recently received in Liverpool to the effect that the expedition had succeeded in proving that the chimpanzee can be infected with yellow fever by means of infected *Stegomyia* mosquito. This discovery is likely to prove important from a scientific and practical point of view.

New Instruments.

THE Lawrence patent portable water steriliser for travellers in the Tropics.

We have seen this apparatus at work, and can commend it as both efficient and portable. The price, some £5, places the four gallon per hour steriliser within the reach of all travellers in tropical countries.

Notes and News.

COMMENTING on the first report of the bacteriologists who have been studying the etiology of plague, the *Times of India* says: "The conclusions which these facts force home with remorseless logic is that even with our increased scientific knowledge we cannot secure absolute results against plague, with ordinary sanitary measures. We can reduce the virulence of the seasonal epidemics by rat and flea destruction; we can prepare particular localities to resist the disease through the warning which is now conveyed by the epidemic amongst rats; we can reduce the media of infection by the use of insecticides wherever dead rats are found; we can protect a section of the population by making their dwellings rat-proof; we can raise the resisting power of the people and increase the facilities for sanitary work by improving the conditions amongst which the poor live. But none of these measures, or all of them combined, no matter how vigorously and ably they may be prosecuted, even promise absolute results in the conditions of life of a great Indian city, unless they are combined with the practice of inoculation. It is as true to-day as it was before the Plague Commission set to work that there are only two certain methods of combating plague—to run away from it or to protect one's self against it."

With this somewhat despondent verdict of our lay contemporary we can, however, by no means agree, as Australian experience has shown that rat destruction, properly carried out, may be trusted as a sufficient measure of protection, and though native prejudices may in certain localities place obstacles in the way of the successful operation of the plan, we believe that these difficulties are by no means insuperable, provided that due tact and consideration be exercised in meeting them.

ONE of the Nobel prizes for 1906 has been divided between Professor C. Golgi, of Pavia, and Professor Ramon y Cajal, of Madrid.

ANKYLOSTOMIASIS has been declared to exist in Virginia, United States of America.

THE University of Sydney has established a diploma in Public Health.

MEDICAL supervision of the Mecca pilgrims is being devised on an elaborate scale.

There has been an outbreak of plague at Djeddah, the disembarkation port for Mecca in the Red Sea, and a strict quarantine and medical inspection is being prepared before the pilgrims are allowed to leave Djeddah for Mecca. Half way to Mecca, and again at Mecca itself, the pilgrims are to be medically inspected. An isolation hospital has been established at Mecca.

YELLOW FEVER IN CUBA.—Owing to the relaxation of hygienic measures in Havana, there is evidence that yellow fever is again increasing in the island of Cuba. Under the directing hand of Dr. Gorgas, yellow fever was extinguished in Cuba, but under the *régime* of the Cubans since they were granted self-government, the island, from a hygienic standpoint, is rapidly falling back into the pestilential state which had existed there until the United States Government assumed control.

DURING 1905 the deaths due to wild animals in India were as follows:—Snakes caused 21,797 deaths; elephants, 48; leopards, 401; tigers, 786; wolves, 153. Cattle were destroyed by wild animals to the number of 92,277. No fewer than 16,915 wild animals were killed.

THE mortality of children born in Calcutta during 1905 amounted to 310 in every 1,000.

RATS AND PLAGUE.—The Medical Officer of Health for the City of Madras believes that the freedom of Madras from plague is due to the fact that there are few brown rats infesting the sewers of the city. Were their numbers greater, the disease would in all probability have spread extensively.

MOSQUITO DESTRUCTION.—The introduction of a little silvery fish, named in the Punjab the "Chilwa," and in the Deccan and South India the "Roopha," into pools infested with mosquito larvæ, has proved an efficient means of destroying mosquito life. This fish—the *Cheela argentea*—is found all over India, and would seem an excellent larvicide. Quicklime thrown in stagnant pools has also been used with good effect in the destruction of these pests.

COUNCIL OF MEDICAL INSTRUCTION FOR TURKEY.—UNDER the title of the "Conseil d'Instruction Médicale," a new medical council has been instituted in Constantinople. The duty of this body is to control the medical and sanitary departments of the Ottoman Empire. Professor Mazhar Bey is the president of the Council.

MOSQUITOES AND MALARIA.—At a special meeting of the Bangalore municipal commissioners to consider what steps should be taken to repress malaria, Captain Standage, I.M.S., Residency Surgeon, addressed them on the subject of the connection of the mosquito with malaria. The work done by the Health Department in using kerosine oil on tank borders and ponds justifies the hope that the problem of decreasing malaria is not beyond the capacity of the municipality. He therefore proposed that a pamphlet which he had drawn up on the scheme be printed in several languages and circulated broadcast. This contains a

popular exposition of the mosquito theory, and there are hopes that the people will take kindly to the destruction of mosquitoes. To popularise the theory an experimental school of instruction is to be opened here on December 1st, and will last for four months. It will be open to six officers and non-commissioned officers each from the Poona and Secunderabad Divisions.—*Pioneer Mail, November 23rd*, 1906.

One might wish, however, that, in place of being left to the initiative and enthusiasm of individual officers, anti-malarial sanitation should be adopted and enforced as a universal sanitary policy by the Government of India. The ravages caused by malaria in the cantonments of the Punjab, however, show that this is far from being the case, and this mail's news from Delhi speaks of the disease as raging there in a fashion it certainly could not do if proper steps were taken to limit the mischief. Surely the experience of Havana and Panama, to say nothing of older successes, should suffice to convince the "Little tin gods on wheels" that anti-malaria sanitation is something more than a "doctor's fad."

Recent and Current Literature.

A tabulated list of recent publications and articles bearing on tropical diseases is given below. To readers interested in any branch of tropical literature mentioned in these lists the Editors of the Journal of Tropical Medicine and Hygiene *will be pleased, when possible, to send, on application, the medical journals in which the articles appear.*

"Australian Medical Gazette," October 20, 1906.

I. Polycythæmia and Chronic Cyanosis without Splenic Enlargement.

Reissman, C., contributes an interesting article on this subject. A girl, aged 18, became gradually cyanosed. The liver increased in size as the cyanosis became more chronic. A more or less acute illness, preceded by attacks of unconsciousness, followed by vomiting, diarrhœa, headaches, giddiness, drowsiness, signs of venous obstruction in the chest and leg, hæmoptysis, an increased number of red cells in the blood, increased excretion of chromogen in the urine, and increased coagulability of the blood. Liver abscess was at first suspected, but search for pus in the liver proved negative. A mediastinal tumour suggested itself, but the subsequent history cancelled this belief; the absence of leucocytosis negatived an inflammatory origin. The patient recovered, and the assumption that the venous obstruction was due to thrombosis seems to be rational, especially in view of the fact that of the recorded cases, *post-mortem* evidence seems to point to thrombosis and thrombotic softening. The explanation given by Osler in cases of the kind is that there is increased viscosity of the blood depending upon numerical increase of the red cells.

This disease is in many respects analogous to myelogenic leukæmia, the bone-marrow in one case affording an excess of white cells, but in polycythæmia the red cells are in excess.

Reissman suggests the X-ray treatment for polycythæmia, basing his opinion upon the benefits derived in myelogenic leukæmia for this agent.

II. Parotitis during Dysentery.

Bollen, P., met with a case of parotitis in a child aged 4½, during an attack of dysentery. The child fell ill on May 13th, 1906, and the dysenteric attack ran a typical course. On May 25th a swelling over the right parotid region was observed, which subsequently increased, but by June 3rd had wholly disappeared. There was not suppuration in the parotid, but pain with earache and difficulty in movement of the jaw. The pus in the stools and the swelling in the parotid subsided simultaneously. Parotitis is occasionally mentioned as occurring in dysentery, but the ailment is usually part of a general pyæmic condition and ends in suppuration.

"Treatment," November, 1906.

The Treatment of Tapeworm.

Jubb, G., advises for tapeworm treatment rest in bed for two days, a dose of castor oil on going to bed, a milk diet for two days, on evening of second day in bed a second dose of castor oil. On the morning of the third day, while fasting, a capsule containing 15 minims of extract of male fern is given every fifteen minutes till six capsules have been taken. One hour after the last capsule, a tablespoonful of castor oil. After the oil has acted the patient to resume ordinary diet. Jubb finds that male fern exhibited as recommended is equally efficient for *Tænia mediocanellata* or for *T. solium*. The head is best sought for by causing the stool to be dropped in water and searched for in a shallow porcelain tray.

"Medical Record," August 4, 1906.

Splenic Extract in the Treatment of Malaria.

Carpenter recommends the fresh extract of spleen in 5 grain doses every four hours. In quartan and æstivo-autumnal types a hæmatinic is usually required in addition, but in the acute tertian and quotidian types the splenic extract alone is sufficient.

"Semaine Medicale," September 26, 1906.

Zanardini, G., advocates the use of creasote enemata in dysentery, made as follows: 1 drachm of a 10 per cent. solution of creasote is added to the yolk of one egg and made into an emulsion with a litre of water.

Billet has also used creasote in the form of one-quarter to one-half litre of an emulsion made by a 1 or 2 per cent. solution of creasote in almond oil. These enemata are administered twice daily for as long as symptoms continue.

"La Clinique," May 18, 1906.

The Treatment of Leprosy.

Unna considers chaulmoogra oil is the nearest approach to a specific remedy for leprosy we possess. The drug can be given by the mouth or by the rectum, but should not be administered hypodermically, owing to the pain it causes. In order to overcome the difficulties of local medication from thickening of the tissues and the obstruction of the lymphatics by the lepra bacillus, Unna recommends the application of local heat and massage. The parts may be covered with flannel and ironed, or baths of "ink" at a temperature of 86° F., combined with massage. The applications serve to dislodge the bacilli and render them more liable to destruction by ointments containing ichthyol, chrysarobin, pyrogallol, or other bactericides. The ink bath consists of a solution of sulphate of iron and tannin.

Notices to Correspondents.

1.—Manuscripts sent in cannot be returned.

2.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

3.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

4.—Authors desiring reprints of their communications to the Journal of Tropical Medicine and Hygiene should communicate with the Publishers.

5.—Correspondents should look for replies under the heading "Answers to Correspondents."

THE

Journal of Tropical Medicine

SELECTIONS

FROM

COLONIAL MEDICAL REPORTS.

1906.

LONDON:

PRINTED BY JOHN BALE, SONS AND DANIELSSON, LIMITED,

OXFORD HOUSE,

83-91, GREAT TITCHFIELD STREET, OXFORD STREET, W.

Colonial Medical Reports.—No. 16.—Trinidad (*continued*).

RETURN OF INFANTILE MORTALITY FOR THE YEAR 1904-1905.

Diseases	Age Periods					
	Under 1 month	1 to 3 months	3 to 6 months	6 to 9 months	9 to 12 months	Total
Diarrhœa	26	43	44	28	16	157
Lung Diseases	7	10	16	8	4	45
Premature Birth	36	1	..	..	..	37
Debility	33	8	6	1	1	49
Tetanus Neonatorum	30	..	..	..	..	30
Dentition	..	..	2	6	7	15
Malnutrition	6	7	5	4	3	25
Tuberculosis	..	3	4	10	2	19
Influenza	..	..	1	..	..	1
Typhoid Fever	1	1	4	2	1	9
Whooping Cough	1	..	1	1	..	3
Congenital Syphilis	..	4	10	..	1	15
Marasmus	1	5	3	1	1	11
Infantile Convulsions	4	1	5	9	..	19
Malarial Fever	..	1	2	4	1	8
Monstrosity	1	..	..	..	..	1
Hydrocephalus	1	..	..	1	..	2
Hæmorrhage from Umbilicus	12	..	..	..	..	12
Obstruction of Bowels	1	..	..	..	..	1
Meningitis	..	1	3	1	1	6
Peritonitis	1	2	..	..	..	3
Asphyxia	1	..	..	..	1	2
Congenital Lung Disease	2	1	..	..	..	3
,, Heart ,,	2	..	..	..	..	2
,, Liver ,,	3	1	..	1	..	5
Anæmia	..	..	..	1	..	1
	169	89	106	78	39	481

RETURN OF DISEASES AND DEATHS IN 1904, AT THE

Colonial Hospital, San Fernando Hospital, District and Yaws Hospitals.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	26	1	26
Anæmia	600	90	626
Anthrax	—	—	—
Beri-beri	—	—	—
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	73	—	77
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Congenital Malformation	9	—	9
Debility	303	52	308
Delirium Tremens	1	—	1
Dengue	—	—	—
Diabetes Mellitus	14	4	14
Diabetes Insipidus	—	—	—
Diphtheria	3	—	3
Dysentery	—	—	—
Enteric Fever	60	26	65
Erysipelas	12	3	12
Febricula	—	—	—
Filariasis	—	—	—
Gonorrhœa	241	—	247
Gout	—	—	—
Hydrophobia	1	1	1
Influenza	37	1	37
Kala-Azar	—	—	—
Leprosy	14	3	14
(*a*) Nodular	—	—	—
(*b*) Anæsthetic	25	1	25
(*c*) Mixed	—	—	—
Malarial Fever—	—	—	—
(*a*) Intermittent—	—	—	—
Quotidian	—	—	—
Tertian	1,004	3	1,026
Quartan	—	—	—
Irregular	3	—	3
Type undiagnosed	—	—	—
(*b*) Remittent	125	26	127
(*c*) Pernicious	27	23	28
(*d*) Malarial Cachexia	84	6	87
Malta Fever	—	—	—
Measles	1	—	1
Mumps	—	—	—
New Growths—	8	1	8
Non-malignant	19	—	21
Malignant	—	—	—
Old Age	155	55	181
Other Diseases	64	39	65
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	3	2	3
Rachitis	—	—	—
Rheumatic Fever	—	—	—
Rheumatism	211	1	232
Rheumatoid Arthritis	7	—	7
Scarlet Fever	—	—	—
Scurvy	1	—	1
Septicæmia	6	6	6
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox	—	—	—
Syphilis—	—	—	—
(*a*) Primary	33	—	33
(*b*) Secondary	60	—	61
(*c*) Tertiary	76	3	83
(*d*) Congenital	27	12	28
Tetanus	—	—	—
Trypanosoma Fever	—	—	—
Tubercle—	—	—	—
(*a*) Phthisis Pulmonalis	332	157	355
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	3	5	3
(*e*) Tuberculous Disease of Bones	—	—	—
GENERAL DISEASES—*continued.*			
Other Tubercular Diseases	—	—	—
Varicella	—	—	—
Whooping Cough	4	—	4
Yaws	829	3	1,183
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	256	6	265
Circulatory System—			
(*a*) Valvular Disease of Heart	147	38	161
(*b*) Other Diseases	54	24	55
Digestive System—			
(*a*) Diarrhœa	306	121	327
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	6	—	6
Congestion of Liver	10	—	10
(*d*) Abscess of Liver	4	5	4
(*e*) Tropical Liver	17	3	17
(*f*) Jaundice, Catarrhal	—	—	—
(*g*) Cirrhosis of Liver	—	—	—
(*h*) Acute Yellow Atrophy	2	2	2
(*i*) Sprue	—	—	—
(*j*) Other Diseases	1,025	132	1,054
Ear	23	1	24
Eye	312	—	335
Generative System—			
Male Organs	465	8	452
Female Organs	1,007	43	1,033
Lymphatic System	140	59	155
Nervous System	520	104	534
Nose	30	1	32
Organs of Locomotion	171	3	185
Respiratory System	623	120	658
Skin—	—	—	—
(*a*) Scabies	—	—	—
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	—	—	—
(*f*) Other Diseases	1,020	12	1,164
Urinary System	453	135	466
Injuries, General, Local—	—	—	—
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	1	—	1
(*c*) Other Injuries	912	28	952
Parasites—	18	—	19
Ascaris lumbricoides	38	3	39
Oxyuris vermicularis	1	—	1
Dochmius duodenalis, or Ankylostoma duodenale	210	29	216
Dracunculus medinensis (Guinea-worm)	1	—	1
Tape-worm	—	—	—
Poisons—			
Snake-bites	6	1	6
Corrosive Acids	—	—	—
Metallic Poisons	2	—	2
Vegetable Alkaloids	24	3	24
Nature Unknown	—	—	—
Other Poisons	28	—	28
Surgical Operations			
Amputations, Major	—	—	—
,, Minor	—	—	—
Other Operations	—	—	—
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

Colonial Medical Reports.—No. 17.—BASUTOLAND.

Medical Report for the Year ending December 31st, 1904.

By EDWARD CHARLES LONG, M.R.C.S., L.R.C.P.

Principal Medical Officer.

Population.

The census taken in 1904 shows a remarkable increase in the population. In thirteen years, the native population has increased 60 per cent. The number of Europeans, which of course bears an insignificant proportion to the total population, now amounts to 895, as against 578 in 1898.

Of the natives 163,216 are males and 184,515 females. The only age test applied in the census was an under and over fifteen years age limit: 174,043 were under 15 years, and 173,688 over 15 years of age.

There is a good deal of local overcrowding, an evil which, I think, is increasing and unnecessary, seeing that the population works out at 34 per square mile. The natives are housed in huts which are usually placed very close together, forming small villages. The huts are, as a rule, unventilated and very little air circulates between the huts. The ground around them is fouled with all sorts of refuse, excreta, &c. These customs undoubtedly have an unfavourable influence on the health of the community, and coupled with the more general use of European clothing, are partly responsible for the marked increase in tubercular disease, to which subsequent reference will be made.

As there is no registration of births and deaths, no trustworthy information is available concerning the birth and death-rate. The mortality amongst young children is high, and speaking from general impressions, I should say that the death-rate amongst young people generally, is higher than it used to be.

General Health.

The year 1904 was an exceptionally healthy one. The number of patients treated at the dispensaries was less than the previous year, and there were no epidemics.

Small-pox.

No cases of small-pox were recorded during the year. This highly satisfactory state of affairs is undoubtedly due to the energy with which vaccination has been prosecuted during recent years. The majority of the inhabitants have now been vaccinated, and a fair proportion re-vaccinated.

24,301 vaccinations, all with calf lymph, were performed during the year. The value of vaccination is now thoroughly appreciated by the natives. Instead of opposition, we now have frequent applications from chiefs and headmen for vaccinators to be sent to their districts.

Enteric Fever.

Sporadic cases of typhoid have been recorded. The majority of the cases admitted into hospital were labourers who had contracted the disease in neighbouring territories.

Tuberculosis.

I regret to have to record a noticeable increase of tubercular diseases throughout the territory. The increase is traceable to (1) tuberculosis contracted during residence at mining centres; (2) overcrowding in the villages, and insanitary surroundings and habits; (3) the general adoption of European clothing; (4) to direct infection.

A noticeable proportion of the men who have been engaged in underground work at the mines return suffering from miners' phthisis. This cause cannot, of course, be dealt with here. With a view to combating the other causes and instructing the natives in the elementary principles of sanitation and public health, a small pamphlet on the subject has been written, translated into Sesuto, for distribution throughout the native schools. If the reading of this little book is made compulsory in the schools, much good may be looked for by the people thus receiving some simple instruction during youth in those most important subjects, public health and sanitation.

The figures given in the nosological return do not, I think, represent the real number of tubercular cases in the country. Many cases returned as adenitis would, I feel sure, be found to be tubercular, if they could be followed up. Two cases of acute miliary tuberculosis came under my notice during the year, the diagnosis being confirmed by *post-mortem* examination.

Syphilis.

This disease is still an important factor in relation to the health of the nation. The returns show no diminution in the number of cases treated. The widespread prevalence of the disease is having an appreciable effect in lowering the physique of the people.

The identity of syphilis and so-called yaws has been fully discussed in a previous report. As some observers still regard yaws as a separate disease, I would again point out that the experience of medical officers in this country proves that every lesion delineated in Fasciculus XIV. of the New Sydenham Society's Atlas finds its counterpart in syphilitic natives in Basutoland.

New Growths.

Benign growths are still frequently met with, and specimens of all growths are forwarded to the Cancer Research Fund. Malignant growths are extremely rare.

Goitre.

This disease is never seen in the Basuto, but Fingos are very subject to it. It is fairly amenable to treatment by painting with iodine, and the internal administration of iodine of potassium and arsenic.

One case which ended fatally is worth recording. A female Fingo, aged 20 years, was admitted with a large bilateral goitre. It diminished slightly in size under treatment, but the patient, who was a fine healthy-looking young woman, was anxious to have it removed by operation. While waiting for operation, and being apparently in excellent health, the temperature suddenly rose one day to 106° F., accompanied by a very rapid pulse, muscular tremors, and cold sweats. In spite of all treatment, the symptoms persisted, and the patient died forty-eight hours after the first onset of the unfavourable symptoms. No *post-mortem* examination was obtainable.

Rheumatism.

This disease seems to be more prevalent in dry years. The subacute and chronic forms are the most common. Many acute cases probably escape observation from inability to attend at the dispensary. A considerable proportion of the more chronic cases would appear to be gonorrhœal in origin.

We find large doses of perchloride of iron, with saline purgatives, the most efficacious treatment.

Diseases of the Circulatory System.

The increasing number of heart cases is traceable to the prevalence of rheumatism. Syphilis, as far as my observation goes, does not seem to affect the vascular system in natives. Most of the patients only seek advice when the disease is far advanced. Mitral stenosis and incompetence are the most common forms of valvular disease. One death occurred from pericarditis, in which the pericardium was universally adherent.

Respiratory System.

Catarrhal pharyngitis and bronchial catarrh were prevalent during the winter months. Pneumonia was less prevalent than during the previous year.

Generative System.

The only cases calling for notice under this heading were one of hypertrophied prostate in a very old native; the prostate was enucleated by the suprapubic operation, and weighed 8¼ oz. The other case was one of extrauterine fœtation, which was successfully treated by laparotomy.

Diseases of the Nose.

A case of empyema of the frontal sinus, with necrosis of the anterior wall of the sinus, was treated by trephining the sinus, curetting and drainage.

Diseases of the Eye.

The method of subconjunctival injections has been given a fair trial during the year, but the expectations of its value have not been realised.

Meteorology.

This does not call for special notice. The year was again unusually dry, the rainfall being about 12 inches below the average. The crops were, however, saved, and a sufficient food supply assured to the inhabitants. The winter was long and exceptionally cold, but does not appear to have had any ill-effect on the general health.

Colonial Medical Reports.—No. 17.—BASUTOLAND (*continued*).

RETURN OF DISEASES AND DEATHS IN 1904, AT THE

Basutoland Hospitals.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	—	—	4
Anæmia	1	—	70
Anthrax	1	—	5
Beri-beri	—	—	—
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	—	—	—
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Congenital Malformation	—	—	—
Debility	4	—	211
Delirium Tremens	—	—	—
Dengue	—	—	—
Diabetes Mellitus	—	—	6
Diabetes Insipidus	—	—	—
Diphtheria	4	1	5
Dysentery	5	1	32
Enteric Fever	14	1	24
Erysipelas	—	—	9
Febricula	5	—	127
Filariasis	—	—	—
Gonorrhœa	—	—	345
Gout	—	—	12
Hydrophobia	—	—	—
Influenza	1	—	31
Kala-Azar	—	—	—
Leprosy	—	—	—
(*a*) Nodular	—	—	6
(*b*) Anæsthetic	—	—	5
(*c*) Mixed	—	—	4
Malarial Fever—	—	—	—
(*a*) Intermittent—	—	—	—
Quotidian	—	—	—
Tertian	—	—	—
Quartan	—	—	—
Irregular	—	—	—
Type undiagnosed	—	—	—
(*b*) Remittent	—	—	—
(*c*) Pernicious	—	—	—
(*d*) Malarial Cachexia	—	—	—
Malta Fever	—	—	—
Measles	—	—	3
Mumps	—	—	73
New Growths—	—	—	—
Non-malignant	53	2	155
Malignant	4	1	6
Old Age	—	—	—
Other Diseases	—	—	—
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	1	1	3
Rachitis	—	—	9
Rheumatic Fever	—	—	—
Rheumatism	6	—	741
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	6	—	52
Septicæmia	—	—	—
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox	—	—	—
Syphilis—	—	—	—
(*a*) Primary	—	—	11
(*b*) Secondary	—	—	377
(*c*) Tertiary	16	—	765
(*d*) Congenital	—	—	269
Tetanus	—	—	—
Trypanosoma Fever	—	—	—
Tubercle—	—	—	—
(*a*) Phthisis Pulmonalis	8	2	75
(*b*) Tuberculosis of Glands	10	—	58
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	5	—	10
(*e*) Tuberculous Disease of Bones	5	—	12
GENERAL DISEASES—*continued*.			
Other Tubercular Diseases	—	—	—
Varicella	—	—	69
Whooping Cough	—	—	79
Yaws	—	—	—
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	42	1	325
Circulatory System—			
(*a*) Valvular Disease of Heart	6	1	76
(*b*) Other Diseases	6	3	75
Digestive System—	14	2	6,004
(*a*) Diarrhœa	—	—	—
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	—	—	—
Congestion of Liver	—	—	—
(*d*) Abscess of Liver	—	—	—
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	—	—	—
(*g*) Cirrhosis of Liver	—	—	—
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	—	—	—
Ear	4	—	275
Eye	84	—	675
Generative System—			
Male Organs	15	2	103
Female Organs	50	—	544
Lymphatic System	—	—	101
Nervous System	16	—	309
Nose	1	—	104
Organs of Locomotion	25	—	133
Respiratory System	11	1	2,006
Skin—	—	—	—
(*a*) Scabies	—	—	61
(*b*) Ringworm	—	—	71
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	1
(*e*) Eczema	2	—	321
(*f*) Other Diseases	4	—	551
Urinary System	3	—	62
Injuries, General, Local—	—	—	—
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	41	2	351
Parasites—	—	—	—
Ascaris lumbricoides	—	—	2
Oxyuris vermicularis	—	—	28
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	—	—	—
Tape-worm	—	—	74
Poisons—			
Snake-bites	—	—	2
Corrosive Acids	—	—	—
Metallic Poisons	—	—	1
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	—	—	2
Surgical Operations—			
Amputations, Major	—	—	27
,, Minor	—	—	2,002
Other Operations	—	—	—
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

RETURN OF THE STATISTICS OF POPULATION FOR THE YEAR 1904.

	Europeans and Whites	Basuto	Mixed and Coloured
Number of inhabitants in 1904	895	347,731	222
Number of inhabitants in 1891	578	218,324	180
Increase	217	129,407	42

METEOROLOGICAL RETURN FOR THE YEAR 1904.

	Temperature				Rainfall, Amount in Inches
	Shade Maximum	Shade Minimum	Range	Mean	
January	97	48	49	72	7·80
February	89	46	43	67	4·36
March	84	46	38	60	1·93
April	84	28	56	56	1·23
May	74	24	50	49	·60
June	69	17	52	43	1·78
July	69	20	49	44	—
August	81	21	60	50	—
September	81	25	56	53	·69
October	88	33	55	60	1·46
November	96	38	58	67	2·80
December	101	42	59	71	·70

Colonial Medical Reports.—No. 18.—Northern Nigeria.

MEDICAL REPORT FOR THE YEAR 1903.

By Dr. S. W. THOMPSTONE.

Principal Medical Officer.

ESTIMATED POPULATION FOR THE YEAR 1903.

THE average European population resident in Northern Nigeria during the year was 309. This includes both officials (civil and military) and non-officials (traders, missionaries, &c.).

DEATHS.

There were 18 deaths during the year, 12 amongst officials, and 6 amongst non-officials. Of the total deaths 3 occurred in action, and 1 from ptomaine poison, leaving altogether 14 deaths which were attributable to the effects of the climate.

DEATH-RATE PER 1,000.

This gives a total death-rate of 58·25 per 1,000 calculated on the average resident population, or, excluding the four deaths above referred to, of 45·3 per 1,000.

COMPARISON WITH LAST YEAR.

Last year the average resident population was 290, and the number of deaths 9, a death-rate of 31·03 per 1,000. There has been an increase of population over last year therefore of 19, and in the total death-rate of 27·2 per 1,000. Comparisons made between statistics

of mortality based on such a relatively small population as that of Northern Nigeria, which has been occupied by Europeans for so short a time, are, however, obviously fallacious, and until records of a number of years are available it cannot be stated that the death-rate of one year is above or below the normal rate.

PREVALENCE OF SICKNESS IN THE DIFFERENT SEASONS OF THE YEAR, AND CHARACTER AS TO MILDNESS OR SEVERITY OF DISEASES PREVAILING.

The months of September, October, November and December, show the greatest amount of sickness, and March, April, May and June, the least, the rainy season having been the most unhealthy part of the year.

The character of the various diseases met with has not changed, with the exception that blackwater fever has assumed a more severe form, the cases have been more serious and the death-rate higher.

RELATIVE MORTALITY IN THE DIFFERENT SEASONS.

The greatest number of deaths in any one month occurred in September. There were no deaths in February, June and August.

METEOROLOGICAL CONDITIONS OF THE SEASONS.

The rainfall during the year was 32·88 inches at Zungeru, and 59·85 at Lokoja—the greatest recorded having been at Lokoja in September, when it amounted to 13·97 inches in the month. The average at the two stations at which complete records were kept was 46·36 inches for the year. The maximum shade temperature in Lokoja was 101° in March, the minimum 56° in January. The highest mean temperature was 84·4° in March, and the lowest 78·4° in August. Last year the maximum shade temperature was 102° in June, and the minimum 51° in December. The highest mean temperature was 85° in April, and the lowest 72° in November. The rainfall at Lokoja in 1902 was 53·61 inches. In Zungeru the maximum shade temperature was 107°, which was recorded in March, and the minimum 60° in November. The highest mean temperature was 89·7° in March, and the lowest 78·4° in August. The highest mean relative humidity was 86·6 per cent. in August, and the lowest in December, 55·4 per cent. Hygrometrical observations were not taken, however, until May. The general direction of the wind was S.W. for the greater part of the year both at Zungeru and Lokoja. I append a chart which shows graphically the seasonal variations of mean temperature, relative humidity, rainfall and sickness rate.

New meteorological stations have now been established in all provinces, and returns will be available for the next annual report, which will give more representative records of the different degrees of temperature, rainfall, and relative humidity met with throughout the Protectorate.

PARTICULAR DISEASES DURING THE YEAR.

The prevalent diseases among Europeans have been malarial fevers and dysentery. Of the former (excluding blackwater) there were 384 admissions with 2 deaths, and of the latter 41 admissions with no deaths. Sixteen cases of blackwater fever occurred throughout the Protectorate during the year, with 6 deaths, a case mortality of 37·5 per cent. There were 3 cases of small-pox amongst Europeans, with no deaths.

GENERAL SANITARY CONDITION OF THE PROTECTORATE.

The general sanitary condition of the stations occupied by Europeans is being improved gradually, but much yet remains to be done. The Government premises are kept clean, and are well drained, but the water supply in most out-stations is poor, and the houses merely temporary mud and grass structures. The native towns, with the exception of those in the vicinity of the European settlements, are practically in their primitive condition.

ZUNGERU.

Sanitary State of the Principal Stations with reference to Water Supply, Drainage, &c.

Average European population, 50.

Deaths during the year, 5.

The general sanitary condition of Zungeru is good, the cantonment is kept clean, and is well supplied with surface drains running down to the Dago river, which effectually carry off all surface water. The general health of Europeans throughout the year has been good.

Water Supply.

The water supply is derived from the Dago river, which flows through the cantonment; it has not proved satisfactory during the dry season, owing to the extreme drought, drinking water having had to be carried a long distance from the Kaduna river. A scheme is now in progress for damming the stream, which is hoped will keep it running in future. Tanks are also being fitted round the bungalows to collect rain-water. A pumping station on the Kaduna would solve the problem of obtaining a good supply the year round.

Disposal of Refuse.

The dry earth system for the disposal of excreta is in use, and has proved satisfactory—the contents of pails being buried in trenches. All combustible refuse is burnt, and the rest buried at some distance from the cantonment.

LOKOJA.

Average European population, 42.

Deaths during year, 2.

The sanitation of Lokoja has much improved recently—the Government premises being in good condition, and the lines occupied by native soldiers clean.

Water Supply.

This is derived from the Niger river, and is distilled before being issued for drinking purposes; the supply is ample, and the quality all that can be desired.

Disposal of Refuse.

As at Zungeru and all other Government stations.

Drainage is satisfactory, by surface drains to the river.

The hospital accommodation is quite inadequate for a station of this size, through which all the invalids in the Protectorate pass on their way to England. A new hospital is, however, now in course of erection, which will amply meet all requirements for some years to come. It will probably be ready for occupation In April next.

ILLORIN.

European population, 12.
Deaths during the year, 1.
The sanitary condition of this station is good, except as regards the position of the native barracks, which are too near the Europeans. These are being moved.

Water Supply.

The drinking water for the Europeans is obtained from a well about 30 feet in depth; its quality is fair.

Disposal of Refuse.

As in all other stations.
Drainage good.

SOKOTO.

European population, 8.
Deaths during the year, none.
The general sanitary condition is good. There is, however, a good deal of swamp in the wet season near both the fort and the Residency, which requires draining. Much has been done, but much still remains. Near the fort it is especially improved, but that near the Residency is a much more serious matter, and will take much time and labour to render satisfactory from a sanitary point of view. All that can be done is being done in this direction.

Water Supply.

This is obtained from rock springs in good positions; the water is of excellent quality.

Disposal of Refuse.

As elsewhere.
Drainage: Open drains have been, and are being cut, to take off surface water.

KANO.

European population, 14.
Deaths during year, none.
The European station is situated about three-quarters of a mile from the native town of Kano, and consists of the Residency and the military lines, the latter lying about 200 yards south-east of the former. The Residency used to be the former Emir's summer residence, and consists of blocks of houses and several outhouses. The general sanitary condition is satisfactory, except during the rains, when drainage is difficult, owing to the flatness of the surrounding country.

Water Supply.

All water is obtained from wells, and is boiled and filtered before use.

Disposal of Refuse.

By burning and in trenches.

ZARIA.

European population, 25.
Deaths during the year, 1.
The present site occupied by the civil population is unsatisfactory. The military lines have been moved four miles away to Dandua, a much better position from a sanitary point of view; the question of moving the civil population is under consideration.

Water Supply.

This is poor, being derived from wells, none of which are above suspicion, the quality is inferior, and the supply meagre.
At Dandua there is a running stream of good water.

Disposal of Refuse.

As in other stations.

YOLA.

European population, 8.
Deaths during the year, none.
The sanitary condition of this station is good. In the early part of the year much annoyance was caused by mosquitoes. A "mosquito brigade" was organised in August, and the Medical Officer reports that he has now filled all possible breeding places within 800 yards of the Residency with sand and planted grass over them. Mosquitoes are now rarely found in the vicinity of the European dwellings.

Water Supply.

The water is obtained from the Benue, poured into settling jars, boiled, and passed through a Berkefeld drip filter.

Drainage.

Good, except in one place, to the west of the Residency, where a swamp formed during the wet season. This, however, only existed for a short time when the rains were at their heaviest.

VACCINATIONS PERFORMED DURING THE YEAR AND THE CONDITION OF THE POPULATION IN RESPECT OF PROTECTION FROM SMALL-POX.

Systematic vaccination in Northern Nigeria has been commenced during the year. Arrangements have been made for a small weekly supply of lymph to be sent to all stations, as it is found from experience that there is great difficulty in obtaining it in an active condition if kept in this climate for more than a few weeks at the outside.

The native population is at present (with the exception of 174 cases successfully vaccinated during the last three months, and those who have already suffered from the disease) entirely unprotected from small-pox. On account of the enormous size of the Protectorate, and the relatively small staff available for these duties, it will be many years before much can be done to vaccinate even a small proportion of the inhabitants, but in view of the frequency of outbreaks of this disease, it is of the utmost importance that active measures should be taken to protect, at any rate, those natives who live in the vicinity of European stations.

Colonial Medical Reports.—No. 18.—Northern Nigeria— (*continued*).

GENERAL HEALTH.

Europeans.

The general health has not been so good as last year, both the death and invaliding rates having been higher for all classes of the community. Analysis of the statistics of mortality for the year shows that the death-rate from climatic causes among Government officials has been remarkably less than among the non-official population. There were resident during the year an average of 273·8 officials in the Protectorate, amongst whom there were 9 deaths from disease, a death-rate of 3·2 per cent., the average resident non-official population for the same period being 35·2 with 6 deaths, a death-rate of 17·04 per cent.; the non-official death-rate being 13·8 per cent. greater than the official for the year.

There have been 34 officials and 9 non-officials invalided in the twelve months, a total invaliding rate of 13·9 per cent.

Natives.

The total number of natives treated at the Government hospitals and dispensaries during the year was 3,983, an increase over the previous year of 876. A serious outbreak of small-pox occurred at Lokoja in June. The disease was introduced by freed slaves brought down the Benue. Fortunately, however, by prompt isolation and vaccination of contacts it was prevented from spreading to the native town. There were altogether 77 cases, with 8 deaths.

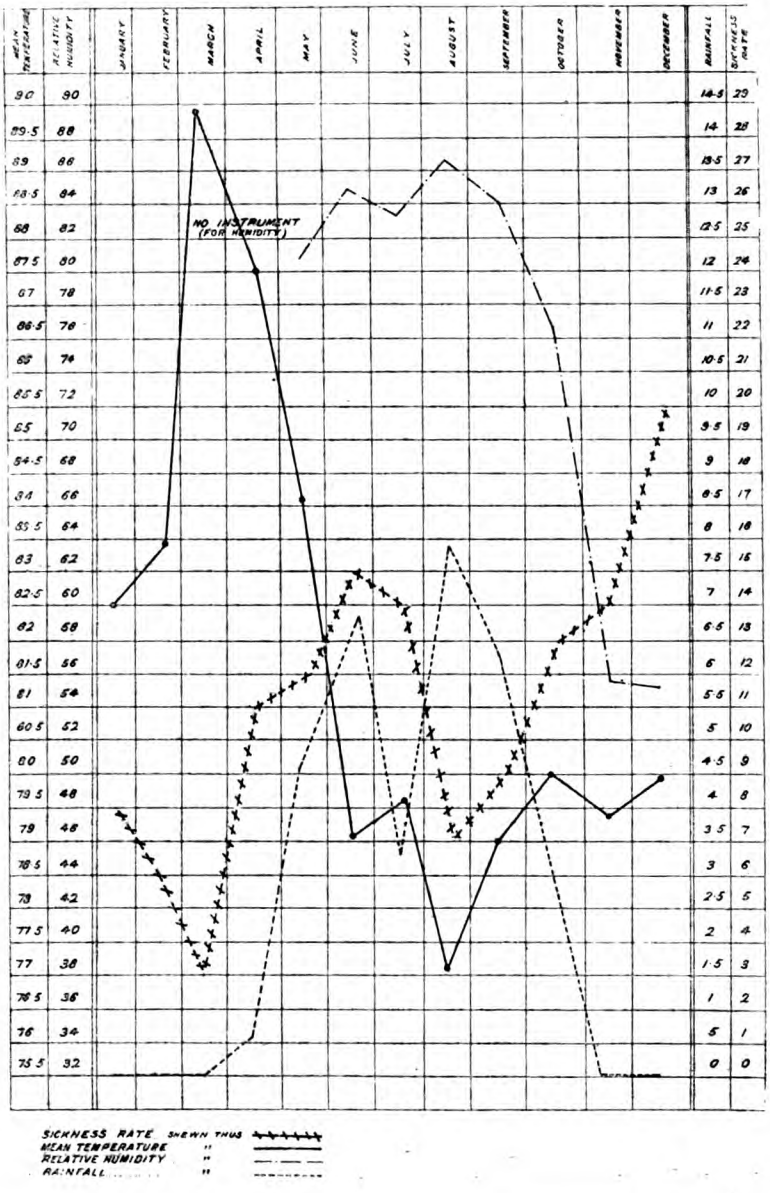
Steps are being taken for the provision of permanent enclosures for the isolation of infectious disease both at Lokoja and Zungeru, in which grass huts, which can be burnt when no longer required, will be built as wanted.

The amount of venereal disease met with is still regrettably large, there having been 627 cases of gonorrhœa treated during the year, and 98 cases of syphilis.

I attach the following returns:—

A. Statistics of European population.

B. Nosological Returns, Zungeru.[1]



No. 19.—Northern Nigeria.—Medical Report for 1904.

By DR. S. W. THOMPSTONE, *Principal Medical Officer.*

ESTIMATED POPULATION FOR THE YEAR 1904.

As in former years statistics of European population only are given, it being impossible to estimate with any approach to accuracy the number of natives in the Protectorate.

The average number of Europeans resident in Northern Nigeria during the year was 322, including both officials and non-officials—312 being males and 10 females.

DEATHS.

There were 13 deaths in all during the year, 8 amongst officials, and 5 among non-officials. Of these deaths 1 was due to accident, leaving 12 attributable to climatic causes.

DEATH-RATE PER THOUSAND.

The total death-rate for the year, calculated on the average resident population, and including deaths from all causes, was 40·37 per 1,000, or excluding the one accidental death, 37·26. There is a very noticeable difference in the relative mortality of officials and non-officials, there having been 5 deaths

[1] Diagram only printed.

amongst 52 non-officials, as against 8 deaths (including one from accident) amongst 270 officials, giving a non-official death-rate of 96·15 per 1,000, and an official one of 29·62. This difference being brought about almost entirely by the more careful selection of candidates for employment in Government service, and by their shorter tour of residence—many of the men sent out by the trading firms being obviously physically unfit for tropical service.

Comparison with Previous Year.

Last year the average resident population was 309, and the number of deaths 18—the death-rate being 58·25 per 1,000. There has been an increase of European population over last year of 13, and a decrease in the death-rate from all causes of 17·88 per 1,000.

Prevalence of Sickness in the Different Seasons of the Year, and General Character as to the Mildness or Severity of the Diseases Prevailing.

As in former years, the rainy season was the most unhealthy for Europeans, July being the worst month, and the month with the heaviest rainfall. The smallest number of admissions was recorded in February. The general character of the diseases prevailing showed no change except in the case of hæmoglobinuric fever, which has become more prevalent but has assumed a milder type. There were 31 admissions with 5 deaths from this disease during the year—a case mortality of 16·1 per cent.—as against 16 cases with 6 deaths in 1903. An increase in the number of cases with a very marked reduction in the death-rate—the case mortality last year having been 37·5 per cent.; one case of enteric fever occurred in Bornu—the first recorded in Northern Nigeria.

Relative Mortality in the Different Seasons.

There was practically no difference in the relative mortality in the different seasons, the deaths being pretty evenly distributed throughout the year. There were no deaths during the months of January, March, September, and December.

Meteorological Conditions of the Seasons and their Probable Effect with Regard to Health.

Zungeru.—The rainfall during the year was 51·1 inches, or 18·22 inches more than in 1903, the wettest month being July, with 15·07 inches. Rain fell during eight months of the year, from March to October, inclusive—the heaviest fall recorded being 2·64 inches in the twenty-four hours, on August 24th. The maximum shade temperature was 103° F. in March and April, the minimum, 56° F., which was recorded in November, December, and January. The highest mean temperature was 86° in April, and the lowest 77° in July, August, and December, the mean temperature for the year being 79°. The mean relative humidity for the year was 63·6 per cent., the highest mean being 82 for July, and the lowest 38 for December—calculated from readings taken at 9 a.m. The lowest actual relative humidity recorded was 15, from hygrometer readings taken at 4 p.m. on December 27th.

Lokoja.—The total rainfall was 41·72 inches for the year, or 18·13 inches less than last year—the heaviest rainfall having been in July, 8·34 inches. The maximum shade temperature was 102° on March 11th, and the minimum 57° on December 23rd. The highest mean temperature was 86° in March, and the lowest 79° in July, August, September, and December. The mean temperature for the year was 80° F.

Yola.—Total rainfall 33·77, the greatest recorded being 10·99 inches in August; the heaviest fall occurring on June 21st, 2·10 inches.

The mean temperature for the year was 80°, the maximum being 107° F., which was recorded on March 16th, and the minimum 60°, on January 13th.

Complete statistics are not available from any other stations, as their meteorologlcal instruments did not arrive until after the commencement of the year.

The general direction of the wind throughout the Protectorate was from the south-west from June to November, and from the north-east during the remaining months of the year; the Harmattan lasting, with slight intermissions, from December to the end of May; the first tornadoes occurring in March, and the rainy season ending in October.

With regard to the probable effect of the meteorological conditions on the health of the community, it may be stated generally that Europeans have the best health in the dry season, and natives in the rains. Europeans, by taking proper precautions, avoiding in great part the diseases that affect the native in the dry season when water is scarce and polluted, and the native being less affected by the great cause of the excessive mortality among Europeans—malaria—a disease more especially of the wet season.

Particular Diseases that have Occurred during the Year.

By far the greatest amount of sickness during the year has been due, as in the past, to malaria; the total admissions from this disease (excluding blackwater fever for the sake of convenience) having been 515, with 3 deaths, compared with 386 admissions with 2 deaths last year. Thirty-one cases of hæmoglobinuric fever occurred with 5 deaths, and 18 of dysentery with no deaths. Dysentery is becoming much less prevalent, the total admissions for the year being less than half those in 1903. There were two cases of small-pox among Europeans, with no deaths.

General Sanitary Condition of the Protectorate.

The general sanitary condition of the European stations is good. The principle of forming separate locations for natives and Europeans has been carried out in all cases as far as possible, and sites have been chosen for permanent buildings in the headquarters of the various provinces. The question of improving the water supply is being solved in great measure by the supply of small condensers.

The large native towns are still in their original condition as regards sanitation, and it will be probably many years before anything can be done to improve them. They are kept clean as far as outward appearances go, but the old system of digging wells and privies side by side obtains everywhere, and probably accounts for most of the intestinal diseases met with amongst natives.

Sanitary State of the Principal Stations with Reference to Water Supply, Drainage, &c.

Zungeru.—The headquarters of the Protectorate has an average resident population of 69·5 Europeans, 66 officials, and 3·5 non-officials. The cantonment is kept clean, and is well supplied with surface drains running down to the Dago river, which effectually carry off all rain-water. Early in the year a series of dams was constructed across the river with the object of holding up the water and providing for a continuous flow throughout the dry season. The system has proved most successful, and a condenser has been erected which provides the European residents with a plentiful and pure supply of drinking water the whole year round. In addition to this, iron tanks have been fitted to most of the bungalows to store rain-water during the wet season.

Disposal of Refuse.—The dry-earth system is in use for excreta—as is the case in all Government stations—the contents of the pails being emptied into shallow trenches and buried. All combustible refuse is burnt daily, and the rest buried at some distance from the cantonment.

The general health of the official population has been good; that of the employés of the Niger Company extremely bad. This difference is due, as pointed out earlier in this report, principally to the want of care exercised in the selection of suitable men, and the long tour of service required of them.

Lokoja had an average resident population during the year of 65·9 Europeans, 51·7 officials, and 14·2 non-officials. The sanitary condition of the European quarter is good, and the lines occupied by the native soldiers are well kept and clean. The cantonment is well supplied with surface drains running down to the Niger, and refuse is disposed of as at all other stations.

Drinking water is supplied by a condenser from the river; the supply is ample, and the quality excellent. The new hospital for Europeans, referred to in my last report, has been completed, and has been in use since May. It is cool, well ventilated, and large enough to meet all requirements for some years to come.

Zaria.—The average resident European population during the year was 23. The site now occupied by the civil population is most unsatisfactory, the water supply is insufficient and bad, and the ground unsuitable. A new site at Dandua, five miles away, has been occupied by the military during the year, and has proved to be an excellent one. It is proposed to move the entire European population out there early in 1905, and abandon the old situation at Zaria.

The health throughout the year has been good, there having been no deaths. The water supply at Dandua is obtained from a running stream, and is of good quality and ample in amount.

Kano.—The average resident European population during the year was 18·4; the general health was fair.

The sanitary condition of the site at present occupied is as good as the nature of the ground will allow. Drainage is unsatisfactory during the wet season owing to the flatness of the surrounding country—no proper fall being obtainable, and the soil becoming waterlogged in heavy rains. The water supply is obtained from shallow wells, and is insufficient for the needs of a large population during the dry season. The question of moving to a more suitable locality is under consideration, and several alternative sites have been proposed; no particular place has, however, yet been decided on, the local conditions varying so much at different seasons of the year, that it was considered inadvisable to make a final choice until more extended observations have been made.

Vaccinations Performed during the Year, and Condition of the Population in Respect of Protection from Small-pox.

One thousand three hundred and four successful vaccinations have been performed during the year, all stations being now supplied with a small weekly or fortnightly consignment of lymph. Great difficulty is experienced in obtaining it in an active condition at those stations which are farthest away in the interior, the long journey on carriers' heads in the hot weather rendering it in many cases inert on its arrival. The returns received from the different stations show a regularly decreasing scale of successful vaccinations, according to the distance from Lokoja; Lokoja itself heading the list, with Katagum and Bornu at the bottom.

There have been two more cases of small-pox among the white population during the year, again demonstrating the fact that the disease can be acquired from natives, and refuting the popular theory held by many Europeans to the contrary. The natives throughout the Protectorate, with the exception of those successfully vaccinated during the last two years and those who have already suffered from the disease, are entirely unprotected from small-pox, and all that can be done at present is to vaccinate all Government employés and those natives living in the immediate vicinity of the various stations, anything like general vaccination, though most desirable, being quite impracticable.

General Health during the Year.

The general health of the European community has been fair; the death-rate has been considerably lower, but the sickness and invaliding rates higher than last year. More cases of illness have come under treatment, but of a milder type. There have been 50 officials and 17 non-officials invalided during the year, a total invaliding rate of 20·8 per cent., as compared with 13·9 per cent. last year.

The health of the natives has been good through the year, no serious epidemics have occurred, and the death-rate, so far as can be gathered, has been normal. The total number of natives treated at the Government hospitals and dispensaries was 13,504, an increase over the previous year of 9,521. This very large increase is, however, partly accounted for by a change which has been made in the method of keeping the records of cases—no account having been kept in the past of many of the patients. Dispensaries are being established in the native towns nearest the different provincial headquarters, but they will necessarily be only on a very limited scale at first, the expense of equipping fifteen or twenty stations with the necessary

instruments, drugs, and appliances being very great.

During the year 883 patients have been treated as paupers throughout the Protectorate.

With the object of providing for the isolation of infectious diseases, such as small-pox, &c., in Zungeru and Lokoja, permanent enclosures have now been built in each of these stations, one acre in extent, surrounded by unclimbable iron fencing, and provided with lock-up gates. It is intended when the necessity arises to build temporary grass huts within them, which can be put up quickly when wanted and burnt when no longer required.

Venereal diseases have been very prevalent among natives, syphilis being widely distributed throughout the northern and eastern parts of the Protectorate. Nine cases of beri-beri, eight of them at Lokoja, have been admitted during the year, with two deaths. This disease is not endemic so far as can be ascertained, and all cases met with have occurred in the parts of the Protectorate nearest the sea, and in direct communication with the coast.

I attach the following returns :—

Statistics of European population.

Meteorological returns for Zungeru and Lokoja.

Nosological return for Northern Nigeria.

STATISTICS OF EUROPEAN POPULATION.

All Europeans	1900	1901	1902	1903	1904
Average actually in the Protectorate	165	165	290	309	322
Number of deaths	13	9	9	18	13
Number of invalids	21	30	20	43	67

ANALYSIS OF 1904 STATISTICS.

Europeans	Totals	Deaths	Death-rate per 1,000	Invalids	Invaliding Rate per 1,000
Average actually in the Protectorate	322	13	40·37	67	208 0
Officials	270	8	29·62	50	185·1
Non-officials	52	5	96·15	17	326·9

ZUNGERU METEOROLOGICAL RETURN FOR 1904.

	Temperature				Rainfall		Winds		Remarks
	Shade Maximum	Shade Minimum	Range	Mean	Amount in Inches	Degree of Humidity	General Direction	Average Force	
January	102	56	46	80	—	53	N.E.	—	
February	101	60	41	80	—	55	N.E.	—	
March	103	61	42	84	·54	47	S.W.	—	
April	103	67	36	86	2·20	55	S.W.	—	
May	97	68	29	81	6·14	71	S.W.	—	
June	92	68	24	79	7·01	77	S.W.	—	
July	89	68	21	77	15·07	82	S.W.	—	
August	90	68	22	77	10·15	81	S.W.	—	
September	90	67	23	78	6·58	77	S.E.	—	
October...	94	67	27	79	3·41	76	S.W.	—	
November	98	56	42	78	—	52	N.E.	—	
December	99	56	43	77	—	38	N.E.	—	
Total	—	—	—	—	51·1	—	—	—	

Colonial Medical Reports.—No. 19.—Northern Nigeria—(*continued*).

LOKOJA METEOROLOGICAL RETURN FOR 1904.

	Temperature				Rainfall		Winds		Remarks
	Shade Maximum	Shade Minimum	Range	Mean	Amount in Inches	Degree of Humidity	General Direction	Average Force	
January	97	59	38	80	—	—	—	—	
February	96	61	35	81	—	—	—	—	
March	102	65	37	86	1·79	—	—	—	
April	97	66	31	83	3·22	—	—	—	
May	94	59	35	80	7·70	65	S.W.	—	
June	93	67	26	81	7·81	77	S.W.	—	
July	91	68	23	79	8·34	77	S.W.	—	
August	88	70	18	79	2·97	76	S.W.	—	
September	90	68	22	79	7·14	78	S.W.	—	
October	92	68	24	80	2 75	76	S.W.	—	
November	96	63	33	81	—	73	S.W.	—	
December	96	57	39	79	—	73	S.W.	—	
Total	—	—	—	—	41·72	—	—		

RETURN OF DISEASES AND DEATHS IN NORTHERN NIGERIA IN 1904.

Diseases	Europeans					Natives					Remarks
	Remaining at end of 1903	Yearly Total: Admissions	Yearly Total: Deaths	Total Cases Treated	Remaining at end of 1904	Remaining at end of 1903	Yearly Total: Admissions	Yearly Total: Deaths	Total Cases Treated	Remaining at end of 1904	
Small-pox	1	2	—	3	1	3	26	7	29	—	
Chicken-pox	—	—	—	—	—	—	7	—	7	—	
Measles	—	—	—	—	—	—	8	—	8	—	
Enteric Fever	—	1	1	1	—	—	—	—	—	—	
Dysentery	1	18	—	19	1	5	606	94	611	—	
Beri-beri	—	—	—	—	—	2	9	2	11	—	
Malarial Fever	8	515	3	523	3	6	925	8	931	12	
Hæmoglobinuric Fever	—	31	5	31	3	—	1	—	1	—	
Unclassified Fevers	—	10	—	10	1	—	23	—	23	1	
Tubercle	—	—	—	—	—	—	4	—	4	—	
Leprosy	—	—	—	—	—	—	21	—	21	1	
Yaws	—	—	—	—	—	5	18	—	23		
Syphilis	—	—	—	—	—	9	210	—	219	10	
Gonorrhœa	—	2	—	2	—	40	796	—	836	27	
Parasitic Disease	—	2	—	2	—	4	967	—	971	15	
Effects of Poisons	—	—	—	—	—	—	3	3	3	—	
Rheumatism	—	17	—	17	—	5	687	5	692	12	
Anæmia	1	28	—	29	—	—	48	10	48	—	
Debility	—	3	—	3	—	1	25	5	26	1	
Undefined	—	4	—	4	—	2	306	28	308	5	
No appreciable Disease	—	—	—	—	—	—	4	—	4	—	
Diseases of the Nervous System	—	14	—	14	—	—	291	5	291	3	
,, ,, Eye	—	8	—	8	1	10	612	—	622	17	
,, ,, Ear	—	7	—	7	—	—	62	—	62	1	
,, ,, Circulatory System	—	5	—	5	—	—	41	7	41	2	
,, ,, Respiratory System	—	15	—	15	—	5	716	33	721	26	
,, ,, Digestive System	1	101	*2	102	—	7	2,134	45	2,141	18	
,, ,, Lymphatic System	—	10	—	10	—	5	192	6	197	4	
,, ,, Genito-urinary System	—	18	—	18	1	4	286	15	290	13	
,, ,, Organs of Locomotion	—	3	—	3	—	2	88	—	90	—	
,, ,, Connective Tissue	—	12	—	12	—	5	842	1	847	35	
,, ,, Skin	—	21	—	21	—	14	944	1	958	26	
Injuries	—	28	—	28	3	14	2,360	18	2,374	53	
Minor Surgical Operations	—	—	—	—	—	—	94	—	94	1	
Accident (Drowning)	—	—	1	—	—	—	—	—	—	—	
Uncertified	—	—	1	—	—	—	—	—	—	—	
Totals	12	875	13	887	14	148	13,356	293	13,505	294	

* Hepatic Abscess.

Colonial Medical Reports.—No. 20.—The Gold Coast.

MEDICAL AND SANITARY REPORT

FOR THE YEAR ENDING DECEMBER, 1904.

By Dr. KENNETH F. T. BUÉE.

Acting Principal Medical Officer.

(1) General Remarks.

The general health of the Colony has been good.

There has been some increase in the number of cases of small-pox, but the number of deaths has been much lower, 1 in 62, as against 11 in 37 last year.

Measles cases were more numerous, 16 against 6, but there were no deaths.

Dysentery was more prevalent, and shows a total of 82 with 23 deaths, against 56 with 10.

Malaria was slightly less than last year, while the European population is nearly one-tenth greater.

The rainfall throughout was, on the whole, less, an increase over last year being only noted at Axim and Kwitta, and last year's average was low; the result was that in many places lack of water was seriously felt, and vegetables were scarce.

(2) Health of the European Community.

How Employed	Number	Deaths	Invalided	Death-rate per 1,000	Invaliding-rate per 1,000
Officials..	351	8	27	22·79	76·92
Mercantile Firms, &c.	305	3	22	9·83	72·13
Mining Companies	1,222	13	97	10·63	79·37
Missions	75	1	11	13·33	146·66
Total	1,953	25	157	12·80	80·38

The return gives at a glance the points of the European health.

As compared with last year there were more Europeans; the deaths were fewer and the invaliding-rate slightly higher. It seems as though the steps taken everywhere to keep down mosquitoes are bearing some fruit, but in this direction we have been distinctly helped by the dry season.

(3) Native Population.

The health of the native population is fair, the dry weather has in many cases been a cause of suffering and ill-health.

The principal diseases treated were malarial fever, diseases of skin, ulcers, yaws, diseases of intestines and respiratory organs.

Small-pox was not prevalent; there is almost always some present, and probably will be till the whole of the population has been vaccinated; for the most part the people do not raise conscientious objections and it is mainly due to the moving part of the population that small-pox is kept alive, since they are not easily vaccinated.

(4) Meteorological Report.

A new station will be started at Sekondi in January. The reports from Accra, Aburi, Cape Coast, Axim, Kwitta, Kumasi, and Gambaga are appended.

The most noticeable feature is the low rainfall, less even than last year.

(5) Gaols of the Colony.

Reports were received from Accra, Adda, Akuse, Axim, Cape Coast, Elmina, Kumasi, Kwitta, Saltpond, Sekondi, Tarkwa, and Winneba.

The general health was good. The number of cases treated in hospital was 332, and of these 18 died.

The deaths were as follows:—

Sekondi	3
Elmina	2
Cape Coast	3
Saltpond	2
Accra	4
Adda	1
Akuse	1
Kumasi	2
Total	18

The general sanitary condition of the different prisons was as good as could be expected, taking into consideration the class of building in use. Most of prisons are old forts, and in many cases are badly

adapted for the requirements of a gaol. There are very few solitary cells, and the prisoners are confined in associated wards; a custom to be condemned on physical, sanitary, and moral grounds. A central prison for long-sentence prisoners is on the Estimates for this year. The water and food are generally good and sufficient.

The medical officers in charge of the various gaols report as follows;—

Accra.—General health very good throughout the year. Diet good; water good, but occasionally rather scarce. Ventilation of cells good. The prisoners are employed at trades in the prison, and outside at road making and repairing, street repairing, sanitary work, &c.

Adda.—Health good; diet and drinking water good; ventilation poor. Prisoners employed repairing public roads and general scavenging.

Akuse.—On the whole the health of the prisoners during the year was good. Diet and water good; ventilation of cells and wards good.

Axim.—The general health of the prisoners during the year was good. Food good; water good; ventilation of cells and wards fair. Prisoners employed at road repairing, whitewashing, carrying water, &c.

Cape Coast.—Health good; both diet and drinking-water good. Some difficulty in obtaining a sufficient supply of good water during the dry season; ventilation of cells and wards primitive and inadequate; the accommodation is insufficient. Prisoners employed at emptying latrines, cutting firewood, clearing Government land, and carrying water.

Elmina.—Health good; diet and water good; ventilation of cells and wards quite inadequate—very bad. Prisoners employed at cooking, grinding corn, mat and basket making, and public works.

Kumasi.—Health good; food and water both sufficient and good; ventilation fair. Prisoners employed at road-making and cleaning, garden, and general scavenging.

Kwitta.—On the whole the health has been good; diet good; water fairly good; cells and wards are not well ventilated. Prisoners employed for emptying latrines, labour on town roads.

Saltpond.—General health has been good; diet and drinking water good; ventilation satisfactory; employed at usual work.

Sekondi.—General health good; diet and drinking ing water good; ventilation of cells and wards not very good. Prisoners employed at road making and sanitary work.

Tarkwa.—General health fairly good; diet and drinking water good; ventilation of cells and wards not very good. Prisoners employed at usual general work.

Winneba.—General health fairly good; diet and drinking water good; ventilation of cells and wards good. Prisoners employed at usual general work.

(6) The Lunatic Asylum.

There were 71 patients remaining under treatment in the asylum at the end of 1903, and during the year 1904, 34 new cases were admitted, making a total of 105 cases, 83 males and 22 females. During the year 30 were discharged from the asylum, 14 died, and 1 absconded, leaving 60 patients under treatment at the end of 1904. Of the patients who died 12 were males and 2 females; an inquest was held in every case. The health of the lunatics has been fairly satisfactory, and of the 14 deaths during 1904, 12 were in-patients who had been recently brought in from Axim and Sekondi districts.

The food of the inmates of the asylum has been generally of good quality. The water supply is good and the quality excellent; it is stored in the large tank situated in front of the asylum, and its distribution has been carefully supervised.

The occupation of inmates consists chiefly in gardening, emptying latrines and general household duties. A few patients take willingly to work in the garden; most, however, refuse absolutely to do any work.

(7) Sanitary Report.

During the past year great improvements in the sanitation of many of the principal towns in the Colony have been carried out, more especially in the Cape Coast and Sekondi. The resistance to sanitation on the part of the native population of Cape Coast still continues, but not to such an extent as during the previous year, although it is still comparatively active. In other towns it is of a more passive nature; the native is satisfied with the conditions in which he has lived for centuries, and does not wish for anything better.

I append a short summary of the sanitary condition of the principal towns:—

Accra.—The control of the sanitation of Accra is vested in the Town Council. This body, in July, 1903, obtained the services of a European Inspector of Nuisances, trusting that the employment of such an official would tend to promote greater cleanliness and a general improvement in the sanitation of the municipal area. As regards the general cleanliness of the main streets and dust-bins of the town, there has been some improvement, but much yet remains to be done to improve the back streets and outskirts of the town. The water supply, the disposal of sewage, and the removal of ruinous buildings, are all most important, and are all receiving attention. The present dust-bins are inadequate in size, and are being replaced, as funds permit, by larger and better ones. A properly erected incinerator would be of great benefit to the town. An Order in Council has been issued that all tanks, wells, &c., should be rendered mosquito-proof. The new market has been opened at Christiansborg.

Cape Coast.—Great difficulty is experienced in dealing with the drains in many parts of the town. This is largely due to the peculiar construction of these drains and to their being inaccessible. The difficulty is chiefly felt in dry weather.

Owing to the latrines having to be emptied by prison labour, this work has not at all times been satisfactorily performed. The Medical Officer of Health has no authority over these men.

This will probably be improved now that a European gaoler has arrived.

The water supply for domestic purposes is unreliable both as regards quantity and quality.

The work of cleaning the town, filling up holes,

treatment of refuse, and general prevention of Anopheles breeding, continues.

Sekondi.—The neighbourhood of Sekondi is more or less hilly, and certainly picturesque. European Sekondi is well segregated from Native Sekondi, and is proportionately healthy and clean in consequence. Many of the official bungalows are built on the surrounding eminences facing the sea, and a delightful breeze does much to mitigate the unpleasantness of the high temperature.

The town naturally lends itself to sanitation, and its newness, segregation, and cleanliness are factors that will tell considerably as regards its suitabliity for European habitation. There is no reason why Sekondi should not be one of the healthiest towns on the West Coast.

The small rainfall and the consequent scarcity of drinking water, and the presence of the lagoon between Accra and Lagos Towns are perhaps the two greatest drawbacks to contend with, but these are not insurmountable difficulties nor should they be very costly ones.

Axim.—The town of Axim is in a fairly good sanitary state. The number of scavengers is limited, considering the area of the town, but they are assisted by prison labour. The outlying villages are not in a satisfactory state, as most of the inhabitants are engaged in the catching and curing of fish.

Elmina.—The town of Elmina has been kept clean, and as free as could possibly be done from mosquitoes, by supervision being strict in not allowing stagnant water to remain in empty tins, &c. This, no doubt, accounts for the comparative freedom from malarial fever.

The other towns in the district when visited have on the whole been found fairly clean.

Tarkwa.—The sanitary condition of Tarkwa is good. Water is plentiful and fairly good.

Kwitta.—The station is at present in fairly good order. The streets are fairly clean, the town is dry and healthy. The Government bungalows are in good order.

In nearly all the other towns of the Colony some sanitary improvements have been carried out; but there is nothing of any special interest to record.

(8) Departmental.

Medical Officers.—The Medical staff has been up to its full strength.

One medical officer died during the year.

European Nursing Staff.—The staff has been up to its full strength.

Dispensers.—The staff of dispensers is at present below its strength, owing to resignations and dismissals.

Native Nursing Staff.—This is also at present short-handed.

Appendix I.

REPORTS ON HOSPITALS.

Report on the Colonial Hospital, Accra, for the Year ended December 31, 1904.

I have the honour to report that I took over charge of the above hospital from Dr. Rutherford on December 10th, 1904, Dr. Kennen being in charge of the Dispensary.

There have been no important structural alterations during the year. The large tank in front of the asylum has been repaired and cleaned.

In-patients.

The number treated during the year 1904 was 383, as against 469 in 1903.

The 383 for 1904 were compared as follows :—

Europeans 23, as against 51 for 1903.
Native officials 28, as against 45 for 1903.
Civil Police 127, as against 118 for 1903.
Native non-officials 201, as against 255 for 1903.
Hausa W.A.F.F., 4.
Small-pox in 1904, 9.

Out-patients.

New cases, 1904 :—

Males 969, as against 1,759 for 1903.
Females 629, as against 1,170 for 1903.
Civil Police 987, as against 1,164 for 1903.
Old cases treated during 1904, 3,079.

Twenty operations were performed during the year, with two deaths.

The mortality amongst Europeans remains low, there being but one death in hospital (non-official); the same as in 1903, and against three in 1902, and seven in 1901.

The native mortality in hospital was 33, as against 31 in 1903.

Expenditure.

The total expenditure for diets in 1904 was £172 9s. 10d., as against £265 8s. 2d. for 1903. The largest expenditure was in the month of February, £20 10s. 10d.; the lowest in May, £9 2s. 6d. The amount recovered from patients was £87 14s. 3d., as against £145 5s. 7d. for 1903.

An examination was held in July for druggists' licences; there were three candidates, of whom one passed.

Dispensary.

The dispensary has been under the charge of Mr. Cato, assisted by Mr. Laryea.

Nursing.

During the year the nursing has been under the charge of Nursing Sisters Oram, Marshall and Fraser, and a native staff.

The Hospital.

This is well kept, considering the deficient water supply, *vide* Meteorological Report *infra*.

Native nurses and dressers are difficult to obtain; considering night work and the care and attention their employment necessitates, their salaries are inadequate for suitable persons.

Meteorological.

Readings have been taken twice daily.

Rainfall 17·28 ins., as against 20.04 in 1903.

The largest rainfall was in May, 3·90 ins., and June, 8·97 ins.

The highest solar radiation reading was in May, 145·83.

Shade minimum, 62·87, in July.

(Signed) R. D'Arcy Irvine,
Senior Medical Officer.

Colonial Medical Reports.—No. 20.—The Gold Coast— (*continued*).

Report on the Colonial Hospital, Axim, for the Year ended December 31, 1904.

The hospital consists of a European ward of three beds, and a native ward of eight beds. A store-room, pharmacy, and two bedrooms, one of which is occupied by the dispenser and the other by the dresser.

Both wards are large enough for ordinary requirements, but both have been fully occupied on two occasions.

The hospital has been painted during the year, and is now in a much more satisfactory state.

The number of new patients treated in the out-patient department was 802, as compared with 740 in 1903. The attendances of old cases were 2,555, as compared with 4,023 in 1903.

The number of patients admitted into hospital was 162, as compared with 50 in 1903. Very many of these cases, however, did not contract their illness in Axim, but were sent in from outlying bush villages, mining companies, and timber concessions on the Ancobra River. There were several cases admitted, practically moribund, the total number of deaths for the year being thirteen.

(Signed) A. MACQUEEN,
Medical Officer.

Report on the Colonial Hospital, Cape Coast, for the Year ended December 31, 1904.

The number of admissions for the year was considerably lower than that of the preceding year, being 306, against 586 in 1903. This is largely accounted for by the marked improvement in health of both European and Native communities. It is also probable that the floating population in Cape Coast has decreased very considerably since 1903. There was also a marked decrease in small-pox, 100 more cases being recorded in 1903 than in 1904.

Thirty deaths were recorded for the year—a number that cannot be regarded as large when we consider that in many cases natives only bring a case to hospital when they have given up any hope of treating it successfully themselves.

(1) Remittent malarial fever.

(2) Pulmonary diseases, such as bronchitis, pneumonia, pleurisy.

(3) Intestinal diseases, such as dysentery, diarrhœa, colic.

(4) Small-pox, and a number of injuries of various nature.

Amongst those cases admitted there were three diagnosed as cerebral hæmorrhage, having aphasia without loss of consciousness in the early stage.

One case of sleeping sickness occurred in a Hausa soldier. In deference to Mahomedan custom a *post-mortem* examination was withheld.

A convict prisoner admitted with brain symptoms of an indefinite character, accompanied by fever, died after some days' illness.

As I suspected cerebro-spinal meningitis, I held a *post-mortem* examination with Dr. Claridge. Well-marked meningitis was discovered, and pus was found between the brain and the arachnoid membrane.

Amongst the injuries, one case of severe extensive burn ended in death from shock.

One case of gunshot wound died.

A case of compound fracture of the femur led to amputation of the thigh, the case being now nearly fit for discharge from hospital.

In the case of the European who died in hospital, it would appear that his sickness commenced as an infectious influenza cold, as the two Europeans in the factory contracted the disease at the same time. The deceased had been under treatment of a private practitioner, who left the country soon after, and I was called to see the case.

I found the patient was in a state of delirium, due to the abuse of alcohol, and he had been wandering about the house in the night, although in a most serious condition, his temperature being at 106°.

He was admitted to the hospital without delay. I found well-marked symptoms of pneumonia present. The delirium continued until collapse and unconsciousness set in, the patient dying within twenty-four hours. I am convinced that early systematic treatment in hospital would have saved the life in this case.

The other death was that of Dr. W. A. Murray, Deputy Principal Medical Officer, the cause being blackwater fever. Two points are worthy of notice in connection with this case. First, that it was the second attack of this little understood and treacherous climatic disease.

The first attack occurred about the middle of 1894, more than ten years ago.

The second point worthy of notice is that Dr. Murray had just returned from a trying journey through Ashanti, and I understand he was not very fit in health on arrival in Cape Coast.

The case was not entered as an admission to hospital, as Dr. Murray died in his quarters adjoining the hospital. The remaining European cases admitted to hospital presented an unusually mild type of malarial fever, chiefly remittent, and formed a marked contrast to the severe cases common here some years ago.

EQUIPMENT.

The equipment was fairly satisfactory.

STAFF.

The staff was adequate and efficient for the greater part of the year. The European nurse was taken away from this station in October. There was little work for a nurse during the year.

DISPENSARY.

A total of 2,508 cases were attended at the dispensary, mostly of a trivial nature. The prevalent diseases were :—

(1) Pulmonary diseases, such as bronchial catarrh.

(2) Intestinal complaints, such as dysentery, diarrhœa and constipation.

(3) Rheumatism.

(4) Affections of the eye.

(5) Affections of the ear.

(6) Injuries.

(Signed) P. J. GARLAND,
D.P.M.O.

Report on the Colonial Hospital, Sekondi, for the Year ended December 31, 1904.

During the year the medical duties have been carried out by Dr. Buée and myself, I acting until March 11th, and Dr. Buée from the latter date until September 14th, when I again relieved him, and have continued to act until the present time.

During the year the sanitary duties have been carried on by Drs. Beringer, Le Fanu, and Collier in succession.

EUROPEAN HOSPITAL.

The European hospital consists of two wards. The smaller is used for higher grade officials, and contains four beds. The larger is used for second grade officials, and contains eight beds.

Both wards are well ventilated and comfortable in every respect. The whole hospital is kept clean and in good order, and is in a good state of repair.

NATIVE HOSPITAL.

The Native Hospital is situated at some distance from the European, and is well ventilated, clean, and in good repair.

The hospital is made up of three wards, which are as follows:—

One large ward	10 beds
Small ward A	2 ,,
Small ward B	2 ,,
Total	14 ,,

Wards "A" and "B" are set apart for native officials, the large ward being allotted to non-official patients.

There are store-rooms, dispensary, operation room, bath-rooms and other usual offices attached to the hospital.

The supply of instruments and drugs is fairly good.

There have been a fair number of minor operations, and several major operations, including amputation, &c., which I am glad to say have been generally successful in result.

The number of patients treated in hospital was as follows:—

In-patients ...	Europeans ...	191	
	Natives (males)...	121	
	,, (females)	2	
	Civil Police ...	12	
	Total ...	326	
Out-patients	Europeans ...	0	New cases.
	Natives (males)...	1,261	
	,, (females)	81	
	Civil Police ...	132	
	Total ...	1,474	
Out-patients	Europeans ...	0	Old cases.
	Natives (males)...	2,029	
	,, (females)	110	
	Civil Police ...	201	
	Total ...	2,340	

There were thirteen European officials invalided, and two deaths; one from blackwater fever and one from cerebral hæmorrhage.

Amongst the non-officials (European) there were five deaths, only one of these being a permanent resident in Sekondi, the others came in sick from outlying districts. There were no deaths among the native officials.

Amongst the non-officials (natives) the deaths were as follows:—

Males	16
Females	1
Civil Police	*nil*
Total	17

The number of deaths, including all classes, both Europeans and natives, being summarised as follows:—

Europeans	Officials	2
	Non-officials	5
Natives	Non-officials (males)...	16
	Females	1
	Total	24

The majority of cases of illness occurring among the Europeans have been malarial fever of the various types.

REVENUE.

Amount recovered from officials, in-patients (European and native) ...	£228	16	6
In-patients (Civil Police)	2	3	6
,, (Civil non-officials) ...	110	13	0
Amount paid by dispensary paying patients	3	10	0
	£345	3	0

EXPENDITURE.

Expenditure for diets, provisions, fuel, &c., £362 7s. 11d.

The medical staff at present is as follows:—
Medical Officer—W. S. Webb.
Medical Officer of Health—J. H. Collier.
Nursing Sister—A. Wallace.
,, ,, M. Marshall.
Dispenser—F. W. C. Wulff.
Dressers—Four.

The native staff is fairly good. I have always found Mr. Wulff a trustworthy and accurate dispenser.

(Signed) W. S. WEBB,
Medical Officer.

Report on the Colonial Hospital, Adda, for the Year ended December 31, 1904.

I have the honour to forward a Report on the Colonial Hospital at this station, for the year 1904.

I took over the duties of Medical Officer from Dr. Lunn, my predecessor, on February 6th, 1904, since which date I have acted in that capacity.

The buildings consist of a hospital with three wards, a male, a female, and one for Europeans. The

number of beds available for natives are ten, and one for Europeans. There are also two latrine rooms, a dispenser's room, store- and bath-room recesses. The building is completed by one consulting room and dispenser's two living rooms. There are two out-buildings, one being a building composed of a kitchen and three rooms. The hospital is bright, airy, and comfortable, while this, as well as the outbuildings and surroundings, have been kept regularly clean.

ATTENDANCES.

New cases (including 157 paying patients) 1,151, and old cases 1,615. There is a great decrease in the numbers of both new and old cases, and this is the result of the fact that the majority of patients who could afford to pay refused treatment when they are asked to do so.

Fees collected, paying patients during the year, £4 13s. 10d.; average fees charged, 6d. first time, and 1d. each attendance afterwards.

IN-PATIENTS.

There have been forty-two admissions during the year; eight deaths occurred. Two were brought into the hospital in a moribund state, and one died in one hour after admission of fracture of the pelvis, and one, a consumptive, twenty-four hours after admission. The other six died from (1) rupture of the bladder, (2) gunshot wounds, (1) pneumonia, (1) malignant new growth of leg, (1) injury to spine.

There were no major operations, but there were several cases of minor types.

There has been no small-pox, no vaccination performed. One case of diphtheria occurred during the last quarter, out-patient (a child 2 years old) died two days after admission.

(Signed) G. CHARLES WALKER,
Medical Officer.

Report on the Colonial Hospital, Kwitta, for the Year ended December 31, 1904.

BUILDINGS.

The hospital building is a good one. The infectious diseases building is set apart from the hospital, about 100 yards distant. Has not been used this year.

DRUGS, &C.

Drugs and dressings have been sufficient.

IN-PATIENTS.

Sixty-one were treated in the hospital, with five deaths. *Filaria medinensis* caused most admissions.

OUT-PATIENTS.

925 received medicine at the dispensary, mostly paupers. A number came from the outlying villages. Intestinal complaints, skin diseases and injuries were most common. Cases of true tropical diseases are not prominent.

SMALL-POX.

There has been no small-pox, and no vaccination.

(Signed) F. S. HARPER,
Medical Officer.

Report on the Colonial Hospital, Elmina, for the Year ended December 31, 1904.

I have the honour to submit to you the annual report for the medical work carried on at Elmina for the year ending December 31st, 1904.

BUILDINGS.

No alterations have taken place in the buildings during the past year.

The building, &c., is sufficient for the demands made upon it.

WATER SUPPLY.

The supply of water in the tank in the hospital yard is of sufficient quantity to last out the dry season. The quality is good.

DIET, &C.

The diet of the patients has been good both in quality and quantity, the latter being quite liberal.

DRUGS.

The drugs have always been of sufficient quantity to meet all demands.

PATIENTS.

Very few patients have been treated in hospital, and none of those of a dangerous condition, with the exception of a double pneumonia and strangulated hernia.

OPERATIONS.

Since taking over there have been no serious operations, with the exception of one strangulated hernia mentioned in the preceding paragraph.

LATRINES.

The latrines provided are in every way sufficient.

INCOME AND EXPENDITURE.

The income was £7 17s. 9d., and the expenditure was £45 9s. 3d.

(Signed) W. B. THAIN,
Medical Officer.

Report on the Colonial Hospital, Saltpond, for the Year ended December 31, 1904.

During the past year the general health of the Europeans, officials and non-officials has been good. The principal diseases have been malarial fevers and dysentery.

No deaths have occurred, but two non-officials have been invalided, one from remittent fever, by my predecessor in the early part of the year, and the other from blackwater fever, this last December.

During the year there have been 981 new cases and 2,555 subsequent attendances.

Fees to the amount of £8 9s. 6d. have been collected.

Thorough weekly inspections of the town have been made by me since my arrival in July, and the town has been maintained in a good sanitary state.

The scavenging and latrine arrangements have been well carried out under the efficient supervision of the Inspector of Nuisances.

Several water-holes and pools where mosquitoes have been found breeding have been filled up. Many ruined houses have been pulled down, and vacant ground has been fenced in and so kept cleaner.

There has been no small-pox during the year.

The work of the dispensary staff has been entirely satisfactory. I have found Mr. Sutton, the dispenser, invariably most efficient, very willing, and courteous to the patients. Mr. Quansah, the dresser, has also proved most useful, painstaking and trustworthy.

(Signed) ARTHUR E. HORN,
Medical Officer.

APPENDIX II.

Medical Report on Ashanti for the Year 1904.

The health of Kumasi has shown a great improvement during the year 1904, both in the number of officials placed on the sick list and the severity of the attacks of fever.

111 officials were placed on the sick list during the year, and out of that number four were invalided—three to England and one to the Canaries; this latter officer returned and completed his tour. One case of blackwater occurred, and no death took place.

These figures compare very favourably with 1903.

I append comparative list.

INVALIDING.

Four officials were invalided, one to Canary, three to England; both the latter were permanently invalided.

MEDICAL OFFICERS.

Two medical officers have been stationed in Kumasi, and all out-stations have each had the services of one during the year.

SUBORDINATE STAFF.

I am glad to be able to report that Kumasi has had a second dispenser stationed.

MEDICAL STORES.

Good and sufficient for present requirement.

INSTRUMENTS.

Kumasi is fairly well supplied with instruments.

HORSES,

I am glad to say, have shown an improvement, although the death-rate amongst them is still high.

WATER.

European supply good.

Native supply is abundant and good.

QUARTERS FOR EUROPEANS.

Good.

LATRINES.

Pan System.—I understand that 500 pans are on order; this will be of great service to Kumasi in enabling it to be kept in a good sanitary condition.

During the year six latrine houses have been erected in different parts of the town, and are much appreciated by the community.

METEOROLOGICAL CONDITION.

The most remarkable features in the meteorological condition during the year were the heavy rains falling in the months of June and December, as compared with 1903, and the postponing of the Harmattan wind until late in December.

Owing to the short time since merchants have started living here it is difficult to judge as to their health, but so far it has been good.

HEALTH OF NATIVE OFFICIALS

has been good throughout the year. A decided falling off has been shown in the admissions to and attendance at hospital of members of the West African Frontier Force.

OUT-STATIONS.

General Health.—The health of the out-stations in Ashanti has been good throughout the year, with the exception of Odumassi in the north-west of Ashanti; the health at this station has been decidedly bad, two fatal cases of blackwater occurring; and one official was unable to complete his tour of service owing to chronic malaria. The health of the other officials has not been satisfactory.

KUMASI.

Average Official Population	No. placed on Sick List	No. of Cases Blackwater Fever	Number	
			Invalided	Died
	1904.			
25	111†	1	4*	—
	1903.			
25	150	1	8‡	1

OUT-STATIONS.

	1904.			
Odumassi, 3 ..	30	2	1	2
Mampon, 3 ..	6	1	1	—
Kwissa, 3 ..	9	1(mild)	—	—
Obuassi, 3 ..	15	—	—	—

* Invalided to Canary, returned to Colony and completed tour.

† Out of this number 13 suffered from ptomaine poisoning due to bad tinned food.

‡ Invalided to the Islands; died at Canary.

(Signed) H. TWEEDY,
Senior Medical Officer.

APPENDIX III.

Medical Report, Northern Territories, for the Year 1904.

NORTHERN TERRITORIES.

The Northern Territories are divided for administrative purposes into four districts, the White Volta District, the Black Volta District, the Gonja District, and the Kintampo District, and at the headquarters of each district a medical department is maintained. During the early part of this year the headquarters of the Gonja District was removed from the town of Salaga to that of Yegi.

Colonial Medical Reports.—No. 20.—The Gold Coast—(*continued*).

Yegi lies close to the River Volta, about one day's journey from Salaga.

In the six months for which statistics are available the health of all ranks at Yegi has been very inferior to that at Salaga, but too short a period has elapsed since the change to warrant any generalisation from the facts collected.

The following table shows the total number of all ranks who served in the Northern Territories in 1904:—

European Officials	Native Officials	Gold Coast Regiment	Station Carriers
46	29	573	375

Health—Europeans.

All important variations in the health of the European officials are shown in Table A.

They suffered from the following diseases:—

Diarrhœa	2 cases.
Gastritis	1 ,,
Hæmoglobinuric fever	2 ,,
Intermittent malarial fever ...	17 ,,
Remittent malarial fever ...	40 ,,
Renal colic	1 ,,
Vomiting (at Wa) (symptom only)	1 ,,

Thus of a total of 64 cases of illness 59 were of malarial origin.

Invaliding.

Two European officials were invalided during the year after recovery from hæmoglobinuric fever.

Deaths.

No deaths of Europeans were recorded. A military officer who left Gambaga, having completed over a year's service, died of hæmoglobinuric fever shortly after landing in England.

The Age Average of Officers.

Officers under 30 years appear to suffer more severely from disease than those above that age. Unfortunately the age average is decreasing. At the beginning of the year, at Gambaga, it was between 30 and 40 years, but in the latter part of the year it fell to between 20 and 30 years.

A similar decrease is, I believe, common to other stations.

The Native Official.

Health.—All important variations in health are shown in Table B.

They suffered from the following diseases:—

Continued fever	5 cases.
Abscess	2 ,,
Bronchitis	1 ,,
Abscess of liver	1 ,,
Constipation	1 ,,
Diarrhœa	1 ,,
Tonsillitis	1 ,,
Injury	1 ,,

Of 29 native officials serving, 11 were admitted to the sick list during the year.

Invalided: There was no invaliding.

Death: There was no death.

The native official is really a stranger in the Northern Territories, where his mode of life is not that of the Coast town he comes from.

His food also differs greatly from that he is accustomed to at home, on account of the complete absence of plantain, or Koko Yam, from the Northern Territories dietary.

It will be observed, notwithstanding, that he enjoys excellent health, and that his ailments are usually of trifling importance.

Gold Coast Regiment.

All important variations in the health of the Gold Coast Regiment, 2nd Battalion, are shown in Table C.

The men suffered chiefly from the diseases arranged below, in the order of frequency:—

Guinea-worm, continued fever, injuries, constipation, bronchitis, gonorrhœa, syphilis, rheumatism.

Invaliding: Eight men were invalided as unfit for military service, suffering from syphilis, gonorrhœa, cardiac disease, necrosis of bone.

Deaths: Seven deaths occurred during the year from the causes stated below:—

Pneumonia	4 cases.
Epistaxis	1 ,,
Pyæmia	1 ,,
Intestinal obstruction ...	1 ,,

Station Carriers.

All important variations in the health of the station carriers are shown in Table D.

They suffered chiefly from the following diseases arranged below in the order of frequency:—

Constipation, guinea-worm, injuries, bronchitis, rheumatism, diarrhœa, remittent fever, gonorrhœa, syphilis.

Invalided: Twenty men were invalided as unfit for work from syphilis, phagedæna, hernia.

Deaths: Two deaths took place, one from cirrhosis of the liver and one from pneumonia.

Townsfolk.

A total of 1,247 persons were treated at the five dispensaries during 1904.

These persons represented all grades of native society from the towns and villages near the dispensaries. They suffered chiefly from the following diseases, arranged in order of frequency:—

Ulcers, injuries, bronchitis, constipation, ringworm, conjunctivitis, syphilis, guinea-worm, yaws, rheumatism, gonorrhœa.

Sanitation.

The control of the sanitary arrangements is in the hands of the Medical Officer.

There is one Inspector of Nuisances at Gambaga.

Latrines.

Pan latrines are supplied for the use of European officials, and the pans are emptied twice a day by prison labour. Pit latrines are supplied for the use of

the native population. The latrines are dug and kept in good order by prison labour.

Rubbish heaps are formed at suitable places chosen by the Medical Officer, and the heaps are burned weekly.

Slaughter Houses.

All animals to be slaughtered for use as food are daily examined by the medical officer, who has the power to veto the slaughter of those he may consider unfit.

Infectious Disease.

No epidemic of grave infectious nature has occurred during the year.

A mild epidemic of chicken-pox occurred at Wa.

An epidemic of mumps has prevailed at Gambaga for the past three months.

No cases of small-pox were recorded.

The Medical Department.

The medical establishment in the Northern Territories consisted of :—

1 Senior Medical Officer.
4 Medical Officers.
1 Dispenser.
4 Dressers.

Hospitals.

Gambaga.—There is an excellent hospital of ten beds, with operation room, consulting room, dispensary, store, mortuary, kitchen and quarters for the dispenser and dresser.

There is an isolation hospital for infectious diseases. 299 cases were treated in 1904.

Kintampo.—There is a hospital of three beds, with dispensary, store and quarters for the dresser.

Forty-five cases were treated in 1904.

Salaga.—There is a hospital of eight beds, with dispensary and store.

353 case were treated in 1904.

Yegi.—The erection of a hospital will be begun next year. A dispensary and store have been already built.

Three cases treated (in the store) in 1904.

Wa.—There is a hospital, with dispensary, store, kitchen and dresser's quarters.

Ninety-one cases treated in 1904.

Meteorology.

The meteorological station for the Northern Territories is situated at Gambago.

It is supplied with the following instruments :—

Solar maximum thermometer.
Shade maximum ,,
Shade minimum ,,
Dry bulb ,,
Wet bulb ,,
Rain guage.

From Table E it will be seen :—

(1) That the rainfall amounted to 40·51 inches.

(2) That the rainfall occurred in seven months, from April to October inclusive.

(3) That there were five rainless months.

(4) That the average humidity varied almost directly as the rainfall.

(5) That the average minimum temperature approximately corresponded to the average dew point during the rains only.

(6) That during the rainless months there was no dew.

The rainfall for the last three years was :—

1902	...	...	...	31·59 inches.
1903	...	...	...	43·03 ,,
1904	...	...	...	40·51 ,,

(Sgd.) W. M. Graham,
Ag. S.M.O.,
Gambago, Northern Territories.

TABLE A.

Medical Statistics relating to European Officials serving in the Northern Territories, 1904.

1904	Gambaga					Kintampo					Salaga					Yegi					Wa				
	Average Strength	Sick	Number of days on the Sick List	Invalided	Died	Average Strength	Sick	Number of days on the Sick List	Invalided	Died	Average Strength	Sick	Number of days on the Sick List	Invalided	Died	Average Strength	Sick	Number of days on the Sick List	Invalided	Died	Average Strength	Sick	Number of days on the Sick List	Invalided	Died
January	12·0	2	5	0	0	4	0	0	0	0	4	1	4	0	0	—	—	—	—	—	7	2	7	0	0
February	12·7	1	4	0	0	5	0	0	0	0	4	2	4	0	0	—	—	—	—	—	4	0	0	0	0
March ..	11·4	1	2	0	0	8	5	27	0	0	5	2	5	0	0	—	—	—	—	—	4	0	0	0	0
April ..	11·6	1	4	0	0	7	1	7	0	0	4	0	0	0	0	—	—	—	—	—	4	0	0	0	0
May ..	10·2	0	0	0	0	6	0	0	0	0	2	1	2	0	0	—	—	—	—	—	3	0	0	0	0
June ..	10·4	2	8	0	0	4	0	0	0	0	2	0	0	0	0	2	1	4	0	0	3	2	14	0	0
July ..	9·4	0	0	0	0	4	0	0	0	0	1	0	0	0	0	2	2	8	0	0	3	1	10	0	0
August ..	9·3	3	7	0	0	4	0	0	0	0	1	0	0	0	0	2	1	4	0	0	3	2	11	0	0
September	9·2	1	7	0	0	4	1	2	0	0	1	1	3	0	0	2	1	8	0	0	4	2	6	0	0
October ..	9·3	4	29	0	0	4	2	3	0	0	1	1	5	0	0	2	2	9	1	0	6	2	17	0	0
November	8·5	2	29	0	0	4	0	0	0	0	1	0	0	0	0	2	2	3	0	0	6	1	4	0	0
December	8·1	5	18	1	0	4·6	0	0	0	0	1	0	0	0	0	2	2	10	0	0	4	2	8	0	0
Totals..	122·1	22	113	1	0	58·6	9	39	0	0	27	8	23	0	0	14	11	46	1	0	51	14	77	0	0

TABLE B.

MEDICAL STATISTICS RELATING TO NATIVE OFFICIALS SERVING IN THE NORTHERN TERRITORIES, 1904.

1904	GAMBAGA					KINTAMPO					SALAGA					YEGI					WA				
	Strength	Sick	Number of days on the Sick List	Invalided	Died	Strength	Sick	Number of days on the Sick List	Invalided	Died	Strength	Sick	Number of days on the Sick List	Invalided	Died	Strength	Sick	Number of days on the Sick List	Invalided	Died	Strength	Sick	Number of days on the Sick List	Invalided	Died
January	6·0	0	0	0	0	5	2	4	0	0	2	0	0	0	0	—	—	—	—	—	4	0	0	0	0
February	6·0	0	0	0	0	5	0	0	0	0	2	2	10	0	0	—	—	—	—	—	4	0	0	0	0
March ..	6·5	1	4	0	0	5	0	0	0	0	2	0	0	0	0	—	—	—	—	—	3	0	0	0	0
April ..	6·1	0	0	0	0	5	0	0	0	0	3	1	4	0	0	—	—	—	—	—	3	0	5	0	0
May ..	6·9	0	0	0	0	5	0	0	0	0	3	1	31	0	0	—	—	—	—	—	3	1	0	0	0
June ..	5·0	1	2	0	0	5	0	0	0	0	2	0	0	0	0	1	1	4	0	0	3	0	0	0	0
July ..	5·0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	3	2	19	0	0	3	0	0	0	0
August ..	5·9	0	0	0	0	5	0	0	0	0	1	0	0	0	0	2	0	0	0	0	3	0	0	0	0
September	6·0	0	0	0	0	5	1	7	0	0	1	1	15	0	0	2	1	4	0	0	4	0	0	0	0
October...	6·0	0	0	0	0	5	0	0	0	0	1	1	7	0	0	2	1	3	0	0	3	1	19	0	0
November	6·5	0	0	0	0	5	0	0	0	0	1	0	0	0	0	2	1	2	0	0	3	1	2	0	0
December	6·9	0	0	0	0	5	0	0	0	0	1	0	0	0	0	2	0	0	0	0	3	0	0	0	0
Totals..	72·8	2	6	0	0	60	3	11	0	0	19	6	67	0	0	14	6	32	0	0	39	3	26	0	0

TABLE C.

MEDICAL STATISTICS RELATING TO THE 2ND BATTALION GOLD COAST REGIMENT SERVING IN NORTHERN TERRITORIES, 1904.

1904	GAMBAGA				KINTAMPO				SALAGA				YEGI				WA			
	Strength	Sick	Invalided	Died	Strength	Sick	Invalided	Died	Strength	Sick	Invalided	Died	Strength	Sick	Invalided	Died	Strength	Sick	Invalided	Died
January.. ..	309	34	0	0	82	46	0	0	46	10	0	0	—	—	—	—	181	21	0	0
February ..	429	53	1	0	80	32	0	0	46	9	0	0	—	—	—	—	181	19	0	0
March	327	46	0	1	88	51	0	0	46	13	0	0	—	—	—	—	95	20	0	0
April	364	42	1	0	91	23	0	0	46	17	0	0	—	—	—	—	95	13	0	0
May	317	66	0	1	90	20	0	1	46	12	0	0	—	—	—	—	95	21	0	1
June	364	80	2	1	90	18	0	0	27	6	0	0	10	1	0	0	95	14	0	0
July	370	100	0	0	79	14	0	0	7	1	0	0	39	13	0	0	84	9	1	0
August	370	128	1	0	79	12	2	0	14	3	0	0	28	8	0	0	84	7	0	0
September ..	368	89	3	0	79	14	0	0	21	4	0	0	18	3	0	0	84	11	0	0
October	370	76	4	1	64	17	0	0	25	3	0	0	32	12	0	0	84	10	0	1
November ..	327	74	1	0	53	16	0	0	23	3	0	0	45	45	1	0	83	11	0	0
December ..	326	106	0	0	61	13	0	0	23	5	0	0	40	11	1	0	83	13	0	0
Totals.. ..	4,241	894	13	4	936	276	2	1	370	86	0	0	212	93	2	0	244	169	1	2

TABLE D.

MEDICAL STATISTICS RELATING TO STATION CARRIERS SERVING IN THE NORTHERN TERRITORIES, 1904.

1904	GAMBAGA				KINTAMPO				SALAGA				YEGI				WA			
	Strength	Sick	Invalided	Died	Strength	Sick	Invalided	Died	Strength	Sick	Invalided	Died	Strength	Sick	Invalided	Died	Strength	Sick	Invalided	Died
January.. ..	150	24	—	—	56	37	—	—	75	7	—	—	—	—	—	—	19	3	—	—
February ..	140	30	1	—	50	42	—	—	75	8	—	—	—	—	—	—	19	2	—	—
March	165	40	1	—	51	44	—	—	75	9	—	—	—	—	—	—	19	1	—	—
April	147	32	12	—	57	11	—	—	75	4	—	—	—	—	—	—	25	5	—	—
May	133	15	—	—	80	26	—	—	65	3	—	—	—	—	—	—	25	8	—	—
June	136	21	—	—	50	23	—	—	46	2	—	—	50	1	—	—	25	3	—	—
July	102	47	—	—	50	13	—	—	12	3	—	—	35	19	—	—	25	7	—	—
August	129	36	1	1	50	7	—	—	12	5	—	—	40	14	—	—	25	4	—	—
September ..	126	31	2	—	50	10	—	—	12	2	—	—	57	34	2	—	25	6	—	—
October.. ..	123	31	—	—	42	17	—	—	12	4	—	—	59	34	—	—	25	7	—	—
November ..	124	23	—	—	41	21	—	—	12	2	—	—	71	13	—	—	25	7	—	—
December ..	123	22	—	—	47	39	—	—	18	7	—	—	51	22	1	1	31	6	—	—
Totals.. ..	1,598	352	17	1	624	290	—	—	489	56	—	—	363	137	3	1	288	59	—	—

TABLE E.

MONTHLY AVERAGES OF DAILY METEOROLOGICAL OBSERVATIONS AT GAMBAGA, NORTHERN TERRITORIES, 1904.

1904	Average Solar Maximum	Average Shade Maximum	Average Shade Minimum	Average Dewpoint	Average Relative Humidity	Average Extreme Daily Range	The Total Rainfall	Remarks
January	143·35	92·32	69·74	50·23	34·54	22·90	0·00	(1) The season of the rains is preceded and closed by thunderstorms accompanied by violent gales of wind.
February	147·03	92·75	70·41	48·65	30·48	22·34	0·00	
March	154·09	95·41	75·67	58·30	32·70	19·74	0·61	
April	151·50	93·76	73·48	59·08	46·66	18·33	1·74	(2) Hail fell once in May and once in June.
May	146·00	85·38	72·82	64·26	57·80	12·51	6·65	
June	153·23	84·73	69·86	66·66	71·00	14·86	3·19	(3) Early in December the wind changed to N.E., and the so-called Harmattan season began.
July	139·96	79·03	69·90	70·24	83·67	9·19	10·01	
August	144·00	79·61	71·38	70·36	82·77	8·22	7·25	
September	153·26	80·50	70·20	70·80	79·26	10·30	7·97	(4) During the season a strong breeze usually prevails day and night.
October..	150·29	83·00	71·29	71·88	77·64	11·70	3·09	
November	148·50	90·00	71·66	€8·63	56·26	18·33	0·00	(5) The total annual rainfall was 40·51 inches.
December	143·80	90·38	69·35	57·60	41·00	21·03	0·00	

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RETURN OF DISEASES AND DEATHS IN 1904, AT THE

Government Hospitals at Accra, Cape Coast, Elmina, Axim, Kwitta, and Kumasi.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	5	—	5
Anæmia	1	—	1
Anthrax	—	—	—
Beri-beri	8	2	8
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	—	—	—
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Congenital Malformation	—	—	—
Debility	21	2	21
Delirium Tremens	3	—	3
Dengue	—	—	—
Diabetes Mellitus	—	—	—
Diabetes Insipidus	—	—	—
Diphtheria	—	—	—
Dysentery	82	23	82
Enteric Fever	1	—	1
Erysipelas	3	2	3
Febricula	10	—	10
Filariasis	—	—	—
Gonorrhœa	18	—	19
Gout	—	—	—
Hydrophobia	—	—	—
Influenza	2	—	2
Kala-Azar	—	—	—
Leprosy	—	—	—
(*a*) Nodular	—	—	—
(*b*) Anæsthetic	—	—	—
(*c*) Mixed	—	—	—
Malarial Fever—	—	—	—
(*a*) Intermittent—	—	—	—
Quotidian	17	—	17
Tertian	—	—	—
Quartan	162	—	162
Irregular	1	—	3
Type undiagnosed	55	—	55
(*b*) Remittent	237	6	241
(*c*) Pernicious	15	3	15
(*d*) Malarial Cachexia	—	—	—
Malta Fever	—	—	—
Measles	16	—	17
Mumps	—	—	—
New Growths—	—	—	—
Non-malignant	6	—	6
Malignant	2	1	2
Old Age	—	—	—
Other Diseases	—	—	—
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	—	—	—
Rachitis	—	—	—
Rheumatic Fever	1	—	1
Rheumatism	60	—	63
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	—	—	—
Septicæmia	1	—	1
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox	59	1	62
Syphilis—	—	—	—
(*a*) Primary	8	—	8
(*b*) Secondary	9	—	10
(*c*) Tertiary	—	—	—
(*d*) Congenital	—	—	—
Tetanus	3	2	3
Trypanosoma Fever	—	—	—
Tubercle—	3	2	3
(*a*) Phthisis Pulmonalis	—	—	—
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculous Disease of Bones	—	—	—
Other Tubercular Diseases	—	—	—
Varicella	—	—	—
Whooping Cough	—	—	—
Yaws	6	—	6
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	75	2	78
Circulatory System—			
(*a*) Valvular Disease of Heart	5	2	5
(*b*) Other Diseases	14	7	14
Digestive System—	—	—	—
(*a*) Diarrhœa	34	1	34
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	—	—	—
Congestion of Liver	5	—	5
(*d*) Abscess of Liver	12	2	12
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	2	1	2
(*g*) Cirrhosis of Liver	—	—	—
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	180	9	183
Ear	2	—	2
Eye	26	—	26
Generative System—	19	—	19
Male Organs	30	1	32
Female Organs	4	—	4
Lymphatic System	28	—	29
Nervous System	54	19	56
Nose	3	—	3
Organs of Locomotion	33	—	33
Respiratory System	158	25	162
Skin—	—	—	—
(*a*) Scabies	3	—	3
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	1	—	1
(*f*) Other Diseases	132	1	137
Urinary System	14	2	15
Injuries, General, Local—	—	—	—
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	5	1	5
(*c*) Other Injuries	209	5	210
Parasites—	88	—	89
Ascaris lumbricoides	—	—	—
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	64	—	64
Tape-worm	—	—	—
Poisons—			
Snake-bites	2	—	2
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	2	2	2
Surgical Operations—			
Amputations, Major	12	1	12
,, Minor	—	—	—
Other Operations	26	4	26
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

APPENDIX V.

ACCRA.

METEOROLOGICAL RETURN FOR THE YEAR 1904.

Month	Temperature						Rainfall		Wind		Remarks
	Solar Maximum	Minimum on Grass	Shade Maximum	Shade Minimum	Range	Mean	Amount in Inches	Degree of Humidity	General Direction	Average Force	
January	134·90	70·74	87·51	71·41	15·09	79·46	..	80 03	..	12	
February	139·20	73·20	87·37	73·16	13·17	80·26	·21	80·38	..	16	
March	143·90	74·54	86·61	74·41	12·12	80·51	·26	80·87	..	15 1/4	
April	145·26	72·33	87·03	75·36	12·33	81·19	1·83	73·90	..	15 1/4	
May	145·83	69·03	89·06	75·93	10·54	82·49	3·90	77·32	..	14	
June	142·23	63·70	84·40	74·36	10·06	79·38	8·97	85·66	..	18	
July	138·25	62·87	79·38	72·54	6·83	75·96	1·61	92·00	..	19	
August	131·32	69·12	77·90	72·25	5·64	75·07	..	87·93	..	19 3/4	
September	141·53	66·45	81·50	71·43	10·06	76·46	..	82·40	..	18 1/4	
October	145·16	67·16	83·32	71·74	11·58	77·53	·46	74·25	..	12 1/4	
November	143·63	82·86	86·96	71·96	14·99	79·46	·2	70·13	..	13	
December	137·51	81·12	87·00	71·67	15·32	79·33	·2	75·00	..	13	
Totals	1688·72	853·03	1018·04	876·22	137·73	947·10	17·28	959·87	..	186	
Mean	140·72	71·04	84·83	73·01	11·47	78·92	1·44	79·98	..	15·5	

ABURI.

METEOROLOGICAL RETURN FOR THE YEAR 1904.

Month	Temperature						Rainfall		Wind		Remarks
	Solar Maximum	Minimum on Grass	Shade Maximum	Shade Minimum	Range	Mean	Amount in Inches	Degree of Humidity	General Direction	Average Force	
January	118·38	73·77	85·25	82·09	3·16	83·67	·1	82·35	N.W.	..	
February	121·17	72·79	84·06	74·13	9·92	79·09	·55	82·27	N.W.	..	
March	119·67	69·80	78·77	71·93	6·83	75·35	4·16	84·14	N.W.	..	
April	133·43	69·30	88·73	79·33	9·40	84·03	1·84	76·18	..	..	
May	124·48	65·19	82·67	73·70	9·29	78·18	6·24	80·41	..	..	
June	120·80	69·04	76·02	68·00	8·13	72·01	6·47	82·20	N.W.	..	
July	122·06	99·09	72·87	65·61	7·25	69·24	2·19	85·53	N.W.	..	
August	125·22	70·51	77·67	69·12	8·54	73·93	·65	83·79	N.W.	..	
September	132·76	69·63	78·60	67·53	11·06	73·06	2·97	85·83	N.W.	..	
October	136·16	71·58	79·51	69·38	10·12	74·44	2 20	84·40	N.W.	..	
November	125·73	75·90	81·56	71·63	9·63	76·59	·52	83·51	N.W.	..	
December	133·41	74·64	75·32	70·00	6·32	73·16	3·30	87·72	..	..	
Totals	1513·27	881·54	972·03	862·45	99·65	912·75	31·10	998·33	..	..	
Mean	126·10	73·46	81·00	71·87	8·30	76·06	2·59	83·19	..	..	

AXIM.

METEOROLOGICAL RETURN FOR THE YEAR 1904.

Month	Temperature						Rainfall		Wind		Remarks
	Solar Maximum	Minimum on Grass	Shade Maximum	Shade Minimum	Range	Mean	Amount in Inches	Degree of Humidity	General Direction	Average Force	
January	128·74	54·22	87·90	68·38	19·45	78·14	·98	83·74	..	..	
February	130·68	50·96	89·24	68·65	23·68	78·94	1·07	79·75	..	..	
March	163·80	52·12	87·74	72·92	14·48	80·33	8·50	85·48	..	..	
April	127·90	39·46	87·46	71·96	15·83	79·71	5·63	82·76	..	..	
May	121·58	34·58	86·29	71·12	15·16	78·70	14·46	82·77	..	..	
June	121·90	31·24	82·60	71·13	11·46	76·86	32·57	87·93	..	..	
July	122·38	30·16	80·29	70·48	9·80	75·38	·71	84·35	..	..	
August	117·16	24·41	78·51	67·70	10·80	73·10	·75	92·80	..	..	
September	129·43	25·02	81·10	69·53	11·56	73·31	1·11	90·50	..	..	
October	129·45	24·53	82·12	70·80	11·32	76·46	2·56	89·19	..	..	
November	129·16	..	85·33	70·93	14·56	78·13	2·99	84·60	..	..	
December	129·64	..	85·80	74·48	11·32	80·14	3·76	80·58	..	..	
Totals	1551·82	366·70	1014·38	848·08	169·42	929·20	75·09	1024·45	..	..	
Mean	129·31	36·67	84·53	70·67	14·11	77·43	6·25	85·37	..	..	

CAPE COAST.

METEOROLOGICAL RETURN FOR THE YEAR 1904.

Month	Temperature						Rainfall		Wind		Remarks
	Solar Maximum	Minimum on Grass	Shade Maximum	Shade Minimum	Range	Mean	Amount in Inches	Degree of Humidity	General Direction	Average Force	
January	..	69·90	85·70	70·87	14·83	78·28	·48	85·88	..	..	
February	..	69·82	86·55	72·62	13·93	79·58	1·30	77·30	..	..	
March	..	71·32	86·61	72·93	13·67	79·77	3·23	79·66	..	..	
April	..	73·00	86·66	73·33	13·33	79·99	2·15	84·13	..	..	
May	..	72·32	85·90	72·41	13·48	79·15	6·24	80·64	..	..	
June	..	71·03	82·90	70·80	4·19	76·85	4·19	86·83	..	..	
July	..	70·29	80·93	70·90	10·03	75·91	·60	90·58	..	..	
August	..	68·70	79·09	69·03	10·06	74·06	·79	90·11	..	..	
September	..	70·43	80·36	70·66	11·03	75·51	·12	87·53	..	..	
October	..	72·19	82·00	71·83	10·22	76·91	1·20	87·08	..	..	
November	..	73·93	84·83	73·53	11·50	79·18	2·63	80·16	..	..	
December	...	73·38	85·83	73·77	12·06	79·80	·4	81·25	..	..	
Totals	..	856·31	1007·36	862·68	138·33	934·99	22·97	1011·15	..	..	
Mean	..	71·35	83·94	71·89	11·52	77·91	1·91	84·26	..	..	

KWITTA.

METEOROLOGICAL RETURN FOR THE YEAR 1904.

Month	Temperature						Rainfall		Wind		Remarks
	Solar Maximum	Minimum on Grass	Shade Maximum	Shade Minimum	Range	Mean	Amount in Inches	Degree of Humidity	General Direction	Average Force	
January	134·09	69·48	90·96	79·25	10·83	85·10	..	75·33	..	..	
February	136·48	74·72	89·62	77·68	11·93	83·65	·10	72·68	..	..	
March	142·83	75·00	88·93	77·09	11·83	83·01	·8	73·70	..	..	
April	142·00	75·06	89·06	78·40	10·66	83·73	2·11	70·85	..	..	
May	142·80	73·48	89·45	76·70	12·74	83·07	1·72	68·40	..	..	
June	140·46	73·43	89 06	75·60	13·80	82·33	8·26	77·75	..	..	
July	140·06	72·58	88·77	75·70	13 06	82·23	·54	74·67	..	..	
August	135·22	70·54	87·45	73·96	13·48	80·72	·17	81·77	..	..	
September	143·36	71·73	88·00	75·03	12·96	81·51	·52	76·11	..	..	
October	142·00	75·87	88·58	76·41	12·16	82·49	·14	74 00	..	..	
November	147·00	75·06	88·00	77·40	10·53	82·70	..	76·91	..	..	
December	140·03	75·87	87·38	74·67	12·74	81·02	1·76	79·29	..	..	
Totals	1686·33	882·82	1065·26	917·89	146·72	991·56	15·40	901·46	..	..	
Mean	140·52	73·56	88·77	76·49	12·22	82·63	1·54	75·12	..	..	

KUMASI.

METEOROLOGICAL RETURN FOR THE YEAR 1904.

Month	Temperature						Rainfall		Wind		Remarks
	Solar Maximum	Minimum on Grass	Shade Maximum	Shade Minimum	Range	Mean	Amount in Inches	Degree of Humidity	General Direction	Average Force	
January	134·45	..	85·22	63·54	21·64	74·38	·70	72·00	..	..	
February	175·24	..	94·68	65·79	22·62	80·23	·02	73·65	..	..	
March	148·03	..	90·15	70·93	18·88	80·54	3·64	78·25	..	..	
April	140·93	..	..	71·10	..	..	4·22	79·76	..	..	
May	145·22	67·45	..	70·41	..	..	4·78	85·54	..	..	
June	140·03	70·56	84·36	72·63	12·66	78·49	10·10	89·30	..	..	
July	129·09	68·41	79·67	70·22	9·45	74·94	3·60	88·67	..	..	
August	127·74	68·54	79·58	69·83	10·00	74·10	·42	83·03	..	..	
September	170·43	69·53	82·63	71·10	11·80	76·86	2·62	84·93	..	..	
October	151·22	69·67	80·96	71·45	12·22	76·20	5·43	92·90	..	..	
November	149·50	69·86	86·23	71·36	14·86	78·79	1·38	86·00	..	..	
December	140·80	66·41	84·70	68·41	16·29	76·55	2·84	82·23	..	..	
Totals	1752·68	550·43	848·18	836·77	150·42	771·08	39·75	996·25	..	..	
Mean	146·05	68·80	84·81	69·73	15·04	77·10	3·31	83·02	..	..	

Colonial Medical Reports.—No. 20.—The Gold Coast (*continued*).

GAMBAGA.

METEOROLOGICAL RETURN FOR THE YEAR 1904.

Month	Temperature						Rainfall		Wind		Remarks
	Solar Maximum	Minimum on Grass	Shade Maximum	Shade Minimum	Range	Mean	Amount in Inches	Degree of Humidity	General Direction	Average Force	
January	143·35	59·29	92·32	69·74	22·90	81·03	..	34·54	..	..	
February	147·03	51·86	92·75	70·41	22·34	81·58	..	30·48	..	..	
March	154·09	42·43	95·41	75·67	19·74	85·54	·61	32·70	..	..	
April	151·50	..	93·76	73·48	18·33	83·57	1·74	46·66	..	..	
May	146·00	..	85·38	72·82	12·51	79·10	6·65	57·80	..	..	
June	153·23	..	84·73	69·86	14·86	77·29	3·19	71·00	..	..	
July	139·96	..	79·03	69·90	9·19	74·46	10·01	83·67	..	..	
August	144·00	..	79·61	71·38	8·22	75·49	7·25	83·77	..	..	
September	153·26	..	80·50	70·20	10·30	75·35	7·97	79·26	..	..	
October	150·29	..	83·00	71·29	11·70	77·14	3·09	77·64	..	..	
November	148·50	..	90·00	71·66	18·33	80·83	..	56·26	..	..	
December	143·80	..	90·38	69·35	21·03	79·86	..	41·00	..	..	
Totals	1775·01	153·58	1046·87	895·76	189·45	951·24	40·51	693·78	..	..	
Mean	147·91	51·19	87·23	74·64	15·78	79·27	5·06	57·81	..	..	

Colonial Medical Reports.—No. 21.—The Straits Settlements.

MEDICAL REPORT FOR THE YEAR 1904.

By Dr. D. K. McDOWELL, C.M.G.

Principal Civil Medical Officer, Straits Settlements.

POPULATION AND HEALTH.

(1) The following table shows the estimated population and the birth and death-rates for the years 1903 and 1904 for the several Settlements.

(2) The death-rate for the whole of the Colony was 39 in 1904 as against 39·49 in 1903 and 42·96 in 1902, and judging from this there seems to have been an improvement in the public health of the Colony in 1904 over the two previous years.

Settlement	Estimated mean Population		Births		Deaths		Birth Ratio per Mille.		Death Ratio per Mille.	
	1903	1904	1903	1904	1903	1904	1903	1904	1903	1904
Singapore	240,833	246,495	5,089	5,435	11,505	10,937	21·13	22·05	47·77	44·37
Penang	130,121	130,602	2,495	2,493	4,988	5,517	19·17	19·08	38·33	42·24
Dindings	4,236	4,294	136	158	137	128	32·10	36·79	32·34	29·80
Province Wellesley	117,078	117,762	3,813	3,778	3,279	3,392	32·57	32·08	28·01	28·80
Malacca	96,276	96,629	3,976	3,380	3,332	3,259	41·30	34·97	34·61	33·73
Total	588,544	595,782	15,509	15,244	23,241	23,233	26·35	25·59	39·49	39·

From this table it will be seen that there was a considerable reduction in the number of births in Malacca in 1904 as compared with 1903. Singapore, however, shows an increase in the birth-rate and an appreciable reduction in the death-rate, a result which was also obtained in 1903 as compared with 1902.

(3) Of the total number of deaths registered in 1904, 3,841 were among infants of under one year old, against 3,865 in 1903, and 3,631 in 1902. Of the total deaths registered in Singapore in 1904, 284 were among persons who had resided less than one month in the Settlement.

(5) *Beri-beri.*—Two thousand six hundred and thirty-one cases were admitted into hospital with 879 deaths in 1904, as against 1,919 cases with 647 deaths in 1903, and 1,901 cases with 575 deaths in 1902. The total number of deaths registered in 1904, 1903 and 1902 respectively, were 2,287, 1,729, and 1,607. It will be seen, therefore, that this disease has a tendency to increase. Five cases of beri-beri occurred in the General Hospital and 60 in the Tan Tock Seng's Hospital among patients admitted for other diseases. There were 266 cases of beri-beri in the Singapore Prison as against 169 in 1903, but the percentage of deaths was lower in 1904. Following the good result of former years 30 prisoners with beri-beri were transferred to Malacca from Singapore, but the result was not satisfactory.

	Plague				Cholera				Small-pox			
	1903		1904		1903		1904		1903		1904	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Singapore	3	3	20	20	226	190	3	3	109	29	33	11
Penang	..	..	..	..	..	..	..	..	227	57	3	2
Province Wellesley..	..	..	..	..	..	..	..	..	258	49	6	2
Malacca	..	..	..	..	..	..	..	..	266	40	100	7
Total	3	3	20	20	226	190	3	3	860	175	142	22

(4) The above table gives the number of cases of zymotic diseases in the several Settlements in the years 1903 and 1904, and deaths therefrom, not including cases imported into the Colony.

Plague.—The 20 cases in Singapore in 1904 all proved fatal. They occurred in different parts of the town among 17 Chinese and 3 Tamils. Two of the cases were said to be among late arrivals in Singapore, but this could not be definitely ascertained.

Cholera.—Only 3 cases, all fatal, were reported in Singapore, one occurring in the prison. There were none in the other Settlements.

Small-pox.—One hundred and forty-two cases with 22 deaths were reported in all the Settlements, being a great decrease over the figures for 1903.

Enteric Fever.—This, I am afraid, is on the increase. One hundred and seventy-nine cases with 69 deaths were reported in Singapore, as against 148 cases and 47 deaths in the year previous. One hundred and seventy-three cases were treated in hospitals in the several Settlements. Of these 75 died. Three cases occurred in the Singapore Prison.

Diphtheria.—Seventeen cases were reported in Singapore with 9 deaths.

(6) *Venereal Diseases.*—The admissions to all the hospitals for 1904 numbered 1,784, with 95 deaths. In 1903 there were 1,818 admissions, with 96 deaths, and in 1902, 2,341 admissions, with 90 deaths. Of those admitted in 1904, 237 were females, of whom 152 were prostitutes.

(7) Owing to the overcrowding and bad sanitation phthisis is very much on the increase, 1,644 deaths have been registered in Singapore alone, or 2,534 for the Colony.

(8) *Sanitation.*—With the continued overcrowding in Singapore the sanitation cannot be said to be in a satisfactory state. There is practically no sewerage system. The drainage in many places is bad, and the water supply is being constantly cut off. The time has come, I think, when the question of remedying these defects should be seriously considered by the authorities concerned. The want of a good and plentiful water supply is undoubtedly one of the chief causes of the high mortality rate. In

	Number of Patients Treated			Number of Deaths.			Percentage of Deaths to Total Treated		
	Europeans	Asiatics	Total	Europeans	Asiatics	Total	Europeans	Asiatics	Total
(*a*) 1902	1,159	26,515	27,674	68	4,406	4,474	5·86	61	16·16
(*b*) 1903	1,043	24,324	25,367	45	3,911	3,956	4·31	16·07	15·6
(*c*) 1904	1,163	24,769	25,932	69	3,767	3,836	5·93	15·21	14·79

(*a*) Includes 331 cases and 42 deaths in Lunatic Asylum. (*b*) Includes 400 cases and 55 deaths in Lunatic Asylum. (*c*) Includes 485 cases and 59 deaths in Lunatic Asylum.

Penang and Malacca the general condition may be considered satisfactory, but in the former Settlement fears are also expressed of the water supply running short. In the province improvement goes on slowly but steadily.

(9) *Hospitals and Work done.*—The total number of admissions into the hospitals during 1904, excluding the lunatic asylum, was 23,462 against 23,150 in 1903.

(10) The preceding table shows the work done during the last three years.

(11) The diseases responsible for the greatest number of admissions and deaths are shewn in the subjoined Tables, compared with the corresponding diseases and deaths in 1903.

I.—General Diseases.

Diseases	1903		1904	
	Admissions	Deaths	Admissions	Deaths
Dysentery ..	707	267	723	245
Malarial Fever ..	2,005	151	2,694	205
Beri-beri	1,919	647	2,631	879
Phagedœna ..	234	60	344	67
Tubercle of Lungs	730	408	853	484
Venereal Diseases	1,818	96	1,784	95
Rheumatism ..	1,075	..	823	1
Anæmia	964	262	590	93
Debility	907	339	757	270

II.—Local Diseases.

Diseases	1903		1904	
	Admissions	Deaths	Admissions	Deaths
Diseases of the Nervous System (including admissions to the Lunatic Asylum less cases transferred there from other hospitals)	736	112	651	138
Diseases of the Respiratory System (not including Phthisis)	574	108	496	126
Diseases of the Digestive System (including Diarrhœa) ..	2,028	678	1,646	524
Diseases of the Skin..	2,626	4	2,997	4

III.—Injuries.

	1903		1904	
	Admissions	Deaths	Admissions	Deaths
General and Local	1,557	56	1,831	139

(12) *Operations.*—One hundred and twenty-four operations, returned as such, were performed, with 5 deaths. There were also 226 operations performed in the General Hospital, Singapore, requiring the use of an anæsthetic. These were included in the return under the diseases for which they were admitted, but a separate statement shewing the operations performed is put up.

(13) Six specimens of malignant tumours and growths were forwarded to the Superintendent of the the Cancer Research Fund, London, from Singapore, and seven from Penang.

(14) The recovery rate in the Lunatic Asylum in 1904 shows an improvement over that of 1903.

The Maternity Hospital return shows that good work was done there during the year. One Probationer passed her examination and was granted the usual certificate.

(15) *Quarantine.*—Two hundred and seventy-nine thousand two hundred and ninety-seven crew and passengers were examined on arrival in Singapore, and 4,444 pilgrims on departure. In Penang the numbers inspected were 184,691 crew and passengers and 1,435 pilgrims. There seems to be a great reduction in the number of pilgrims inspected both in Singapore and Penang in 1904 as compared with 1903.

Further needed improvements, details of which will be found in the appendix under Quarantine, were carried out on the Station at St. John's. The Port Health Officer reports that the disinfecting steam lighter *Hygeia*, fitted with a Clayton disinfector, has answered all expectations.

(16) *Out-Door Dispensaries.* — Nineteen thousand nine hundred and seventy patients attended at the various Out-Door Dispensaries in the several Settlements during 1904 as against 18,031 the year previous.

(17) *Vaccination.*—The total number of vaccinations performed throughout the Colony during 1904 was 15,765 as against 15,496 in 1903. The following table shows the number vaccinated, with the results in the several Settlements during 1904.

Settlement	Number of Vaccinations Performed	Result				
		Perfect	Modified	Failed	Unknown	
Singapore ..	2,554	2,551	..	3	..	(*a*)
	1,797	1,631	9	96	61	(*b*)
	376	356	3	17	..	(*b*)
Penang	3,280	2,266	633	177	204	
Dindings	133	44	7	13	69	
Province Wellesley	3,680	2,924	287	452	17	
Malacca	3,945	3,379	72	387	107	
Total ..	15,765	13,151	1,011	1,145	458	

(*a*) By Government Vaccinator. (*b*) By Licensed Vaccinators.

The above do not include vaccinations performed in the prisons or at the Quarantine Stations. Saigon Lymph was used throughout the year. The results, although not very satisfactory, especially in Province Wellesley, appears to be an improvement over those of 1903.

(18) *Staff.*—Dr. G. D. Freer, Colonial Surgeon Resident, Penang, returned from leave on March 5th, relieving Dr. T. H. Jamieson, a private medical practitioner.

Dr. R. Dane, Colonial Surgeon, Singapore, proceeded on long leave to Europe on March 4th, his place being taken by Dr. W. S. Sheppard, Supernumerary Colonial Surgeon.

Dr. J. Catto resigned his appointment as Resident Medical Officer, St. John's, and Assistant Port Health Officer, and was succeeded by Dr. D. M. M. Ross, from England, on March 19th.

Dr. A. L. Hoops was appointed House Surgeon in the General Hospital, Penang, a new appointment, and arrived there from England on June 9th.

Assistant Surgeon H. J. Gibbs returned from long leave on November 18th, after having successfully passed the examinations for the L.R.C.P.Lond., and M.R.C.S.Eng. He also took the certificate in psychological medicine.

Assistant Surgeons M. W. Laporte (Singapore), and S. A. O'Keefe (Penang), retired during the year.

Dr. Edith Boomgardt was appointed Assistant Registering Officer of deaths in Penang in place of Assistant Surgeon O'Keefe, retired. An additional Assistant Surgeonship was sanctioned for the Quarantine Station at Singapore. This was temporarily filled by the appointment of Mr. A. P. Dantes, M.R.C.S., L.R.C.P., whose services were also utilised at the General Hospital as House Surgeon.

The posts of matron and three nurse probationers were added to the Lock Hospital, Singapore, and two nurse probationers to the General Hospital, Penang.

There were several changes among the nursing staff tending much to disorganise good work and discipline.

With the exception of some old hands the dresser staff does not seem to be satisfactory. Although the scheme for salaries has been improved the class of men applying for admission is not promising. This branch of the medical service requires to be strengthened, and I hope, with the opening of the Medical School in the Colony, to have men joining for a lower degree, say, of hospital assistant.

(19) Two Straits Students, Messrs. Sit Peng Lok and B. G. Samy, passed the grade of Assistant Surgeon in Madras, returned to the Straits in 1904, and filled up two posts vacant from the beginning of the year in Province Wellesley and Malacca respectively. At the end of the year there were eleven student apothecaries of the Straits Government in the Madras Medical College. In view of the establishment of a medical school in Singapore no more students will be sent to Madras in future.

(20) The Morphine Ordinance and Opium Ordinance were amended with a view to bringing those dealing in those articles as chemists and druggists under more efficient control, and restricting all unqualified medical men from prescribing the same.

(21) In September, 1904, the Honourable Tan Jiak Kim, a member af the Legislative Council and an influential member of the Chinese community, petitioned the Government on behalf of the Chinese and other communities of this Colony praying for the establishment of a medical school. The Government, notwithstanding the difficulties hitherto experienced in the proposal to establish such an institution, expressed its willingness to sanction such an undertaking, provided the petitioners were willing to pay for the initial cost of same, *i.e.*, for the building and equipment, and raise on endowment fund of $60,000 for the payment of ten scholarships for students of native origin, the Straits Government and the Government of the Federated Malay States undertaking to give five Scholarships each in addition, and paying for the staff and upkeep of the said school. With commendable promptitude Mr. Tan Jiak Kim managed to collect subscriptions far in excess of the amount actually required. All preliminary steps for the establishment of the school have been taken. A Bill constituting the necessary Council will soon be introduced in the Legislative Council, and in a few months hence the school will be an accomplished fact.

May 12th, 1905.

Appendices.

SINGAPORE.

Report by Dr. J. Leask, Colonial Surgeon Resident.

Table A—1.

	Remaining on 31.12.03	Admitted	Total Treated	Discharged	Transferred	Died	Remaining on 31.12.04	Percentage of Deaths to Total Treated
European ..	20	615	635	553	11	42	29	6·61
Natives ..	82	2,169	2,251	1,736	175	261	79	11·63
Native Police..	12	377	389	375	1	1	12	0·25
Totals ..	114	3,161	3,275	2,664	187	304	120	9·28

The work in the wards has been heavy throughout the year, not so much owing to the increase in the number of admissions, which was only 57 over the previous year, as to the large number of daily sick (163·045, the highest on record for this Hospital) and to the large number of Surgical cases in the Native Wards.

Of the General Diseases causing admissions to Hospital, the various manifestations of Malaria come first with 333 admissions and 12 deaths. Next in order are Venereal diseases (including local affections) 298 with 5 deaths, Beri-beri 126 with 41 deaths, Dysentery 120 with 31 deaths, Tuberculosis 108 with 4 deaths, Enteric Fever 76 with 22 deaths, Dengue 45 cases, Debility 32 and 1 death, Anæmia 28 and 1 death, Febricular 20 cases, Tetanus 6 with 4 deaths, Erysipelas 6 with 2 deaths, Pyæmia 4 with 3 deaths, Septicæmia 3 and 3 deaths.

Of the Nervous Diseases, Insanity in its various forms 171, Meningitis 8 cases and 8 deaths were the most noteworthy.

Diseases of the Eye caused 20, of the Ear 15 and Heart diseases 15 admissions with 2 deaths.

Respiratory Diseases.—Pneumonia 42 cases and 15 deaths, Bronchitis 40 and 1 death, Asthma 17 and 1 death and Pleurisy 11 cases were the most noteworthy.

Diseases of the Digestive System.—Diarrhœa 34 cases and 3 deaths, Sprue 18 cases and 2 deaths, Fistula in Ano 17, Constipation 16, Hernia 13 cases and 2 deaths, Hepatitis 13 cases and 2 deaths, Liver Abscess 12 cases and 8 deaths, Appendicitis 12 cases and 2 deaths, Piles 5, and Cirrhosis of Liver 4 cases and 1 death.

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Urinary System.—Bright's disease 9 cases and 1 death.

Diseases of Bone.—Periostitis 5, necrosis 5, caries 4, are of interest.

Diseases of Connective Tissue.—Abscess 49, cellulitis 22 cases.

Skin Diseases.—The most numerous of these were: Ulcer 79 and 1 death, and eczema 25.

Injuries.—The most numerous general injuries were: Multiple injury 35 cases with 10 deaths, burns and scalds 31 cases with 8 deaths, heat-stroke 5 cases and 1 death.

Of the 650 local injuries the most important were: Wounds 480 cases with 4 deaths, compound fracture 64 cases with 14 deaths, simple fracture 45 cases with 5 deaths—these last were in cases of fracture of the spine.

Of poisons the more important were: Alcohol 54, opium 5 cases and 2 deaths, lead and mercury 1 case each.

Parasites.—The most numerous were: *Acarus scabiei* 25 cases, mostly in Chinese Sinkehs, and others of interest were *Ascaris lumbricoides* 3, *Ankylostoma duodenale* 7, *Filaria sanguinis hominis*, 6, *Tænia solium*, 4.

After twenty-one years' experience of the Straits, I cannot help being struck by the steady increase of certain diseases during that period, amongst the Asiatic population chiefly.

The first of these is tuberculosis, mostly of the lung. This disease having once got a footing and having found a suitable environment, has steadily spread.

Along with this I find that fistula in ano is becoming much more common, and lately a few cases of disease of bone, hitherto absent, are beginning to appear.

Pneumonia has been making rapid strides during the last few years.

Enteric fever has become common amongst Europeans and natives.

When in 1884 I reported a case of diphtheria my report was received with incredulity, and I was informed that the disease was not known in the Straits. Since then there have been a number of unmistakable cases, many of them fatal.

A warm, moist climate such as this is an ideal one for the breeding of pathogenic micro-organisms, especially in the crowded native quarters, and it remains *a matter of quarantine to keep other infectious germs out.*

It is scarcely necessary to animadvert on venereal diseases, which have always caused a large proportion of admissions to hospital, except that they are probably an important factor in the causation of insanity, yet general paralysis of the insane, as it appears in Europe, is unknown in Asiatics, and locomotor ataxy is rare.

The Asiatic is becoming Europeanised — too much so—stalls for the sale of bread and butter may be seen along the streets; the domestic servant, who would not help himself to any European beverage but brandy and sherry, has now taken quite kindly also to whiskey and beer, and in fact to anything with alcohol in it, very much to his detriment; and now, though the admissions for alcoholism are still mostly in Europeans, there are a few Asiatic admissions from this cause, Chinese, Sikhs, and Tamils.

Three thousand one hundred and sixty-one patients (of whom 220 were females) were admitted, as against 3,104 in 1903, and the total number treated was 3,275, as against 3,233 in 1903.

The average dailynumber of sick was 163·045—the highest on record—as against 130·22 in 1903.

Deaths.—There were 304 deaths (28 among females), 73 of which occurred within a few hours of admission.

The percentage of deaths to total treated was 9·282, as against 9·029 in 1903.

European Wards.—There were 615 cases (of whom 70 were females) admitted to these wards. European members of the Police Force are included in these admissions.

The diseases for which the greatest numbers were admitted were: Venereal diseases 71, malaria 49, alcoholism 39, tuberculosis 31, dysentery 19, rheumatism 10, parasites 10, liver abscess 9, hepatitis 7, appendicitis 6.

Local and general injuries were the cause of 70 admissions.

Zymotic Diseases.—Small-pox 4, dengue 29, mumps 3, enteric fever 22, influenza 1.

Transfers.—There were 11 transfers, 3 to quarantine, 3 to native wards, and 5 to lunatic asylum.

Deaths.—There were 42 (6 being females).

The percentage of deaths to total treated in the European wards was 6·614.

Native Wards (not including native police).—There were 2,169 patients (of whom 150 were females) admitted, as against 2,187 and 141 respectively in 1903.

The diseases for which the largest numbers were treated were: Malaria 235, insanity 162, beri-beri 118, venereal diseases 140, dysentery 86, tuberculosis 67, ulcer 63, abscess 39, pneumonia 35, anæmia 24, diarrhœa 23, bronchitis 20, rheumatism 20, fistula in ano 15, alcoholism 12, constipation 12, debility 21, heart diseases 11, asthma 11, hernia and sprue, each 10, Bright's disease 7, hepatitis 6, appendicitis 5, abscess liver 3.

Local and general injuries were responsible for 630 admissions.

Zymotic Diseases.—Enteric fever 52, dengue 12.

Five Chinese patients developed beri-beri in the ward while under treatment for other diseases respectively 14, 19, 71, 111 and 115 days after admission.

Deaths.—There were 261 deaths (22 of whom were females) among patients treated in the native wards; 65 died within a few hours of admission.

The percentage of deaths to total treated was 11·63.

The number of native private patients depositing money in advance to defray hospital expenses was 662, as against 778 in 1903.

Native Police.—There were 377 admissions, as against 353 in 1903.

The causes of admission were: Venereal diseases 79, malaria 49, malingering 40, bronchitis 16, ulcer 15, dysentery 15, tubercle 10, rheumatism 10, beri-beri 6, pneumonia, asthma, varicose veins and sprue, each 4, alcoholism 3, local and general injuries 21.

Zymotic Diseases.—Dengue 4, small-pox 1, chicken-pox 1, enteric fever 2, and influenza 4.

Transfers.—One to quarantine camp.

Absconders.—There were 58, mostly Malays.

Deaths.—One Malay died of beri-beri.

Percentage of deaths to total treated, ·25.

Medico-legal Work.—There were 1,242 cases sent to hospital by the police for examination or admission, as against 914 in 1903.

There were 57 dead bodies sent for *post-mortem* examination by the coroner, as against 76 in 1903.

There were 189 persons sent to hospital for observation as to sanity, as against 161 in 1903.

My observation with regard to sending these to the General Hospital in my report for 1903 holds good for 1904.

Operations.—There were 226 surgical operations, requiring the administration of a general or local anæsthetic, performed during the year.

The most numerous and interesting were: On tumours 3, abscess 31, excision of glands 23, removal of sequestra 13, excision of shoulder 1, amputations 20, trephining skull 2, harelip 1, enucleation eyeball 5, suturing divided tendons 3, paracentesis thoracis 1, excision of ribs for empyema 1, exploratory puncture of liver 2, gastrostomy (Francke's) 1, hepatic abscess, 12, abdominal section for suturing wounded intestine 3, strangulated hernia 9, hernia radical cure 2, typhlitic abscess 1, fistula in ano 12, circumcision 17, hydrocele radical cure 3, removal lymph scrotum 1, elephantoid labium 1, curetting uterus 3, ovariotomy 1, abdominal section for pelvic hæmatocele 2.

During the last twenty-four years it has been my practice to give from 25 to 30 minims of tincture of belladonna a quarter of an hour or twenty minutes before the administration of chloroform, and I have had no case of death from chloroform in my practice during all these years. The active principle of this drug has a paralysing action on the cardio-inhibitory fibres of the vagus and so prevents reflex inhibitory impulses from affecting the heart's action.

As an Asiatic will just as soon part with his life as with a limb, a great deal of the surgery in this hospital is necessarily ultra-conservative, and the death-roll is consequently heavy, and stay in hospital long. On the other hand, the most wonderful recoveries take place sometimes.

Staff.—I have been in charge throughout the year.

House Surgeons.—Dr. Ford and Dr. Barrack have been house surgeons, and on September 1st, Mr. A. P. Dantes, M.R.C.S., L.R.C.P.Lond., assistant surgeon, took duty in addition as acting house surgeon, thus placing a great deal more time for purely professional work at the disposal of the house surgeons.

It would be to the advantage of the hospital to have three house surgeons permanently, there being too much work for two.

In the subordinate staff I have to record numerous changes again, militating against the efficiency of the hospital.

Police Force.

Report by Dr. W. G. Ellis, Police Surgeon.

The total number of the force attending the out-patient room at the Central Station was 4,096, as compared with 3,478 for 1903, and 4,305 for 1902. More of these than is usual were malingerers, and when it could be definitely brought home to them they were reported and punished. Latterly I have sent many of those whom I considered to be malingering to hospital for observation, where they were detained for a few days and so lost their pay, and the crime is now diminishing.

The greatest number seen on any one day was 34, the lowest 2.

The average daily number attending shows a slight increase over the previous year; it was as follows:—

Month	1899	1900	1901	1902	1903	1904
January ..	32·72	17·69	14·12	12·92	12·08	11·83
February ..	23·95	18 33	12·55	11·70	15·90	11·62
March	29·76	18·15	13·73	11·12	11·72	12·11
April	28·04	18·02	14·86	17·10	12·14	11·12
May	28·57	19·01	12·34	17·32	11·68	14·52
June	25·65	22·64	12·33	17·70	13·74	15 61
July	23·03	18·72	11·77	15·00	12·18	15·07
August ..	22·37	18·97	12·65	12·05	11·08	11 88
September ..	28·65	16·04	13·08	14·00	10·46	12·69
October ..	29·19	21·93	12·66	14·10	10·25	16·46
November ..	26·65	21·50	13·2	14·10	10 63	13 57
December ..	25·84	18·91	13·08	16·22	10·30	14·32

Of the out-patients seen, 357 were sent to hospital as in-patients, compared with 556 sent to hospital in 1899, 290 in 1900, 294 in 1901, 350 in 1902, and 317 in 1903. Others of the force have been admitted to the General Hospital for treatment, having been sent by inspectors as urgent cases; of these I have no records.

The 357 were suffering from the following disorders: Unclassed fevers 65, intermittent fever 5, dengue 10, enteric fever 2, dysentery 10, diarrhœa 17, beri-beri 12, phthisis 4, bronchitis 16, pneumonia 1, appendicitis 1, Bright's disease 2, rheumatism 11, syphilis 40, gonorrhœa 37, cellulitis 20, synovitis 5, ulcers 8, minor injuries 9, hydrocele 3, eye and ear affections 9, skin diseases 6, tape-worm 3, alcoholism 4, debility 9, malingering 48.

During the year there have been 70 cases of beri-beri, with 2 deaths, and necessitating the invaliding of three men from the service. Nearly all of these cases occurred in the Central Station in the months of June and July. This station at the time was much overcrowded, men using the same beds in relays, and no proper attention was paid to cleanliness. The cessation of the overcrowding, a thorough clean up, and the regular use of disinfectants, quickly bore fruit, though a few odd cases continued to occur until nearly the end of the year. The cases were mostly slight, and coming under observation early soon recovered upon being transferred to the seaside stations.

Three hundred and thirty-three candidates for the force were examined during the year; of these 262 were passed as fit, and 71 were rejected.

The causes for rejection were as follows: Over age 4, ill-development 24, phthisis 8, hernia 2, anæmia 4, heart disease 9, enlarged spleen 7, hydrocele 1, venereal diseases 8, and impaired vision 4.

The nationalities were: Twelve Europeans passed and none rejected, 117 Malays passed and 35 rejected, 52 Sikhs passed and 14 rejected, 37 Indians passed and 12 rejected, 30 Chinese passed and 8 rejected, 5 Eurasians passed and none rejected, and 9 Sikhs passed for re-engagement and 2 rejected.

The sanitary conditions of the 35 stations are fairly satisfactory, and several minor improvements have been completed during the year. Details of inspections, with my suggestions, are made in a book which is forwarded to the Chief Police Officer from me to time.

Prison Hospital.

Report by Dr. J. Leask, Colonial Surgeon in Charge.

The sanitary condition of the prison was fair, and was further improved during the year.

I mentioned in my report for 1903 that more ventilation was required for the cells and in the Middle Grade Work Yard.

Dr. C. W. Daniels, Director of the Institute of Medical Research, Federated Malay States, visited the prison in February and reported on its sanitary condition, making certain recommendations.

The following additions and alterations were carried out:—

(*a*) Perforated iron plates were inserted at the bottoms of the cell doors, giving better floor ventilation.

(*b*) Iron weather-boards were fixed over the cell windows, and the wooden boards placed inside the windows in wet weather were done away with. In some instances, notably at the punishment cells, these plates have been too much sloped, cutting off too much light.

(*c*) The bathing tanks were separated from the latrines, thus doing away with a possible source of contamination of water, as prisoners *will* drink from the bathing tanks when not watched.

(*d*) The latrine in the kitchen, also contiguous to a water-tank, was done away with, and a more sanitary arrangement made outside the kitchen.

(*e*) A new set of water-pipes was laid throughout the prison, away from the drains, doing away with another possible source of water contamination.

(*f*) The cement work of the prison was relaid throughout, with the exception of the interiors of the halls. When newly laid down this work has been so slippery that a number of accidents have occurred—two warders slipped and broke their arms, and quite a number of falls amongst warders and prisoners have occurred.

(*g*) The flat parts of the roofs of the blocks were sloped and extra down pipes fixed in order to carry away storm water more rapidly.

(*h*) Iron gratings were substituted for honeycomb brickwork in the arches under the blocks. These are hinged and locked so as to give access for cleaning purposes.

(*i*) The flattened roof ends of the worksheds and wheelhouse were carried out as open gable ends, and this has produced a marked improvement in the air of these places.

(*j*) An allowance of soap is now being issued to the prisoners for body cleansing.

(*k*) The substitution of brick for corrugated iron partitions between the cells is being carried on steadily, but not very carefully, as I notice numerous crevices at the angles of the cells.

In spite of all improvements three cases of enteric fever occurred, two of whom must have contracted the disease in the prison; dysentery has been prevalent; one case of what was clinically cholera occurred, and beri-beri cases have increased in numbers.

The health of the prisoners during the year was not satisfactory. Although there were fewer admissions to hospital (1,009, as against 1,041 in 1903) the average daily sick was much higher (72·47, as against 44·96 in 1903) and the number of deaths was greater than during the previous year.

There were 52 deaths in hospital, as against 45 in 1903 and 38 in 1902, giving a death-rate of 48·01 per mille of total treated, as against 40·7 in 1903 and 26·04 in 1902.

Out of 3,052 male prisoners examined on admission, 1,146 showed signs of present or past venereal disease, as against 916 in 3,272 admissions in 1903.

Diets.—Bengal rice, *i.e.*, rice which has gone through a process of malting, was given instead of Siamese rice on November 1st (except for congee making, for which it was unsuitable).

Births.—A Chinese short sentence prisoner was delivered of a child in February.

Work done in Hospital.—There were 74 patients remaining in hospital on December 31st, 1903; 1,009, of whom 10 were females, were admitted during 1904, giving a total treated of 1,083. Of these, 936 were discharged, 30 transferred to Malacca, 52 died, and 65 remained on December 31st, 1904.

The diseases responsible for the greatest number of admissions were:—

Beri-beri	...	266 cases, as against 169 in 1903 and 415 in 1902.
Fevers	...	163 cases, as against 163 in 1903 and 188 in 1902.
Dysentery	...	136 cases, as against 104 in 1903 and 156 in 1902.
Dyspepsia	...	87 cases, as against 43 in 1903 and 66 in 1902.
Diarrhœa	...	67 cases, as against 112 in 1903 and 186 in 1902.

Deaths.—There were 52 deaths, as against 45 in 1903. The causes of death were dysentery 19, beri-beri 17, pulmonary tuberculosis 7, heart disease 2, cholera, enteric fever, cancer of stomach, fibroid phthisis, enteritis, compound fracture of thigh and cerebral hæmorrhage in beri-beri patient 1 each.

Beri-beri.—Instead of exacerbating towards the end of the year, as it did in 1903, this disease quickly declined from September, as shown in the subjoined comparative table.

In the first quarter of the year there were 63 admissions and 2 deaths, in the second quarter 55 admissions and 3 deaths, in the third quarter 108

TABLE A—2.

SHOWING THE ADMISSIONS AND DEATHS MONTHLY SINCE THE BEGINNING OF THE OUTBREAK.

Month	1897		1898		1899		1900		1901		1902		1903		1904	
	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths
January	..	..	1	..	22	..	5	..	15	1	22	1	22	2	30	2
February	..	..	1	..	25	..	3	..	10	..	8	1	6	..	13	..
March	..	..	..	..	25	..	1	..	4	..	2	..	6	..	20	..
April	..	..	1	..	23	..	8	..	17	..	8	..	3	..	16	..
May	..	..	2	..	5	..	14	2	25	1	18	..	1	..	28	2
June	..	..	..	..	7	2	32	2	17	3	79	3	3	..	11	1
July	..	..	1	..	7	..	36	2	23	2	86	..	1	..	29	1
August	..	..	2	..	19	..	8	1	12	..	27	..	..	..	34	2
September	..	..	6	..	3	..	32	1	10	..	36	3	2	..	45	7
October	..	..	10	..	5	..	24	2	19	1	62	1	7	..	26	1
November	..	..	78	1	8	..	44	7	41	1	35	1	53	6	10	..
December	..	..	22	..	16	..	17	11	26	..	32	1	65	8	4	1
	3	..	124	1	165	2	224	28	219	9	415	11	169	16	266	17

admissions and 10 deaths, and during the fourth quarter 40 cases and 2 deaths.

The third quarter was therefore the most unhealthy as regards beri-beri this year, and in consequence of the large numbers overcrowding the hospital, 30 cases of beri-beri were sent to Malacca on October 6th.

There were 266 admissions and 17 deaths, as against 169 admissions and 16 deaths in 1903, giving the percentage of deaths to total treated as 6·7, against 9 4 in 1903.

Grades Affected.—One hundred and fifty-three cases of beri-beri occurred among short sentence prisoners, 68 among middle, 21 among lower, 15 among revenue, and 5 among upper grade prisoners: 3 cases occurred in prisoners undergoing simple imprisonment and one in a civil prisoner.

Nationalities attacked by Beri-beri.—Chinese 229 with 15 deaths, Malays 28 with 1 death, Indians 8 with 1 death, and Filipino 1.

Sexes attacked by Beri-beri.—In the correspondence in the *Times* newspaper on the Chinese coolie question in South Africa it was stated by a medical writer that females were immune from beri-beri. There were 6 well-marked cases of beri-beri in female prisoners in 1904, 1 Chinese and 5 Malays. In 1900 there were 7 female cases; in 1901, 1 Chinese; in 1902, 1 Chinese; in 1903, 1 Malay.

Length of Imprisonment of those Attacked.—Of the 266 admissions, 51 were primary attacks occurring in prisoners under three months in prison; 87 were primary attacks occurring in prisoners over three months in prison; 5 were recurrences occurring in prisoners under three months in prison; 52 were recurrences occurring in prisoners over three months in prison; 10 were admitted suffering from the disease, and 61 had a previous history of having suffered from beri-beri outside the prison.

Deaths from Beri-beri.—There were 17, and one beri-beri case died of cerebral hæmorrhage and softening. Of these, 14 were short sentence, two middle and one lower grade prisoners.

TABLE A—3.

TABLE SHOWING THE INCIDENCE OF BERI-BERI IN THE DIFFERENT GRADES, SINCE THE BEGINNING OF THE OUTBREAK.

Grade	1897	1898	1899	1900	1901	1902	1903	1904	Total
Upper	..	7	6	9	13	19	9	5	68
Middle	..	94	123	105	55	129	37	68	611
Lower	..	8	6	40	40	102	27	21	244
Short Sentence	3	12	23	52	102	136	88	153	569
Revenue	..	3	6	8	7	19	5	15	63
Civil Prisoners	..	..	1	2	2	10	3	4	22
His Majesty's Pleasure	..	..	..	1	..	..	..	..	1
Females	..	..	..	7	1*	1*	1*	6*	7
Total	3	124	165	224	219	415	169	266	1,585

* Included under Grades.

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Dysentery.—There were 136 admissions and 19 deaths, as against 104 with 13 deaths in 1903. The disease continues to be of a severe type, and ipecacuanha in large doses, with intestinal irrigation (alkaline in the early stages, and of nitrate of silver ½ grain to one ounce in later and more chronic cases), have given the most satisfactory results.

Post-mortem examinations in the fatal cases have shown the same deep necrosis of tissue mentioned last year.

Grades Attacked.—Short sentence 62 cases, middle grade 33, lower grade 22, revenue grade 7, upper grade 3, remand prisoners 4 (simple imprisonment 3), and 2 prisoners from banishment.

Nationalities.—Europeans 2, Chinese 93 with 12 deaths, Malays 27 with 1 death, Indians 13 with 5 deaths, Anamite 1 died.

Dyspepsia.—This has been more prevalent this year, causing 87 admissions, as against 43 in 1903. Fissured tongues and cracked lips, and an eruption of lichen planus are also making their appearance.

Zymotic Diseases.—One case of chicken-pox and one case of measles occurred in short sentence prisoners. The former case probably contracted in prison, and the latter probably came into prison with the disease in the period of incubation.

Cholera.—One Chinese short sentence prisoner contracted cholera after having been over three months in prison, and died within a few hours. Clinically, it was a typical case, but the bacteriological examination was negative.

Enteric Fever.—There were 3 cases during the year.

The first was that of a European short sentence prisoner who was committed to prison on July 22nd, and admitted to hospital on August 2nd, having been feeling unwell for eight or ten days before.

The second case was a Chinese lower grade No. 164, committed to prison March 1st, and admitted to hospital December 13th. The source of infection was probably outside the prison.

The third case was a Chinese lower grade No. 175, committed to prison March 16th, and admitted to hospital December 21st.

The European and one of the Chinese (No 175) recovered, and the other Chinese (No. 164) died.

In the two latter cases Widal's reaction was positive.

In the fatal case the *post-mortem* appearances were very well marked.

There was one case of mumps.

In none of these infectious cases could the source of infection be traced.

Tan Tock Seng's Hospital.

Report by Dr. W. S. Shepherd, Acting Colonial Surgeon.

Buildings.—Only such repairs as were absolutely necessary have been executed during the year, owing to the prospect of an early removal of the hospital to a new site.

The usual whitewashing and tarring were performed twice during the year by the Public Works Department.

Grounds.—The digging of long trenches in many places leading into the main drains has done much to improve the drainage of the grounds.

The hospital is to be congratulated on having obtained the services of Dr. Finlayson as Pathologist. He now conducts the autopsies in all cases except those of medico-legal interest.

Statistics.—The total number of patients treated and the death-rate are set down in Table I., which also gives the figures for the preceding nine years. The death-rate—22·4 per cent.—is a little below the average.

A certain number of admissions are readmissions, as stated in last year's report. It is not easy to estimate this number, as patients when seeking readmission frequently give a new name.

The average daily number was 571.

Table II. gives the diseases for which admission was chiefly sought in 1904 and the previous four years, also the number of deaths from these diseases.

Beri-beri.—One thousand one hundred and twenty-five cases were admitted, as against 975 in 1903. I am inclined to attribute to this increase in our numbers the increase in our death-rate from this disease—46 per cent., as against 36 per cent. in 1903. Our beri-beri wards were undoubtedly too crowded, but there seemed no option between admitting the sick and sending them back to their houses to die. Many of our admissions under this head were cases brought in by the police, who could not be refused admission. A certain number of cases about 60—appeared to have originated in the hospital; but owing to the difficulty of diagnosing latent beri-beri it is not possible to estimate this number with exactness.

During the year trial was made of potassium permanagate as a remedial agent, this drug being administered in two-grain doses twice daily. No good appeared to follow this treatment and after a few months it was discontinued. Our experience seems to indicate that a milk diet is best for this disease. Blisters over the pericardium appear to relieve the distressing cardiac dyspnœa better than any other treatment.

Fevers.—There were 617 cases of malarial fever, 245 cases being of the benign and 372 of the malignant variety. The prevalent benign form is tertian, not more than a dozen cases of quartan occurring in the year. Twenty per cent. of malignant and seven per cent. of the benign cases proved fatal, many of the patients being brought in in a comatose condition by the police.

The intramuscular injection of quinine has been practised in all cases when a rapid result was desirable. No ill-effects have been recorded in a single instance.

There were 70 cases of enteric fever with 36 deaths, as against 11 cases with 7 deaths in 1903. The high mortality rate is due to the lack of skilled nursing and to the fact that the patients are so often brought to hospital in a dying condition.

Fourteen major operations were performed, mostly amputations of the leg for large intractable ulcers.

General Remarks.—During the year I have found it necessary to institute the following changes:—

To set apart a separate staff of dressers for night duty. Hitherto continuous night and day duty has been expected of the dressers, an obviously impossible expectation.

The only drawback to the present system is that it depletes our already very insufficient day staff.

Two senior dressers have been set apart, one for dispensing, the other as steward.

To attempt to locate the dresser to the wards under his particular care. To this end, a table and a chair have been given him in one of his wards, and the dressers' room, situated too far away from the wards to be useful, has been converted to another purpose.

A system of diet indent book wherein the dresser writes his indent each afternoon for the succeeding day. This secures a permanent record, by which expenditure can be checked by myself.

A daily roll-call of the attendants has, indirectly, done much to lessen the number of those running away after each pay day.

An attendance book has been placed in each ward for recording the time and duration of the assistant surgeons' and dressers' visits.

The large staff of ward attendants, coolies, barbers, toties, &c., amounting to about seventy men in all, has been struck off the list of patients. Our daily average number of patients is thus less by this number.

TABLE I.

TAN TOCK SENG'S HOSPITAL.

Year	Remained	Admitted	Total	Died	Average Daily Sick	Percentage of Deaths to Total Treated
1895	536	5,583	6,119	1,465	547	23·94
1896	547	7,041	7,588	2,124	575	26·72
1897	652	7,110	7,762	1,733	598	22·32
1898	617	6,425	7,042	1,402	623	19·63
1899	583	5,887	6,470	1,394	560	21·50
1900	583	5,941	6,524	1,459	574	23·36
1901	549	6,556	7,105	1,694	563	23·84
1902	528	6,562	7,090	1,583	529	22·32
1903	550	6,968	7,518	1,663	589	22·12
1904	562	6,536	7,098	1,590	571	22·40

TABLE II.

TAN TOCK SENG'S HOSPITAL.

Showing Admissions and Deaths from certain Diseases.

Diseases	1904		1903		1902		1901		1900	
	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths
Beri-beri ..	1,125	521	975	395	752	312	747	405	708	305
Ulcer	679	..	823	..	..	..	743	..	819	..
Rheumatism	327	..	674	..	..	..	518	..	651	..
Anæmia ..	280	83	549	167	324	106	294	99	301	113
Debility ..	233	123	430	184	362	118	375	172	150	84
Diarrhœa ..	219	115	402	252	296	176	398	279	437	285
Dysentery ..	195	95	256	127	..	96	..	126	..	158
Secondary Syphilis ..	337	29	344	54	..	..	420	35	324	38
Tuberculosis	343	212	288	190	498	293	412	273	276	186
Malarial Fever	617	95	..	..	..	..	..	..	..	..

QUARANTINE CAMP.

(1) SMALL-POX.

	Remained	Admitted	Total	Discharged	Died	Absconded	Remaining
Male	1	19	20	13	2	1	4
Female ..	..	6	6	4	2	..	..

Of those treated, 8 were Chinese, 6 Tamil, 6 Malays, and 6 miscellaneous.

(2) BUBONIC PLAGUE.

	Remained	Admitted	Total	Discharged	Died	Absconded	Remaining
Male	..	8	8	..	8	..	..
Female ..	..	3	3	..	3	..	..

Of these cases, 8 were Chinese, 1 Tamil, and 2 Bombay men.

(3) DIPHTHERIA.

	Remained	Admitted	Total	Discharged	Died	Absconded	Remaining
Male	..	3	3	1	2	..	..

Two were Chinese, and 1 Arab.

LEPER ASYLUM.

	Remained	Admitted	Total	Discharged	Transferred	Absconded	Died	Remaining
Male ..	15	59	74	9	22	2	31	10
Female	20	6	26	..	..	..	6	20

The sanitary condition of the asylum was good.

The space allotted to the females is, however, very limited. The nine males discharged were handed over to the care of their relatives by order of the magistrate.

LUNATIC ASYLUM.

Report by Dr. W. G. Ellis, Medical Superintendent.

The average daily number of patients resident during the year was 268 (males 213, females 55), an increase of 53 males and 6 females as compared with the previous year.

On December 31st, 1903, there remained 231 patients (males 179, females 52). There were admitted in 1904, males 223, females 31, making the total treated 402 males and 83 females. The maximum

and minimum numbers in the asylum on any one day of the year were respectively 305 and 229.

Of the 283 patients remaining on December 31st, 1904 :—

Males.	Females.	Total.		
151	35	186	came from	Singapore.
39	11	50	,, ,,	Penang.
8	3	11	,, ,,	Province Wellesley.
15	1	16	,, ,,	Malacca.
5	—	5	,, ,,	British North Borneo.
1	—	1	,, ,,	Labuan.
12	1	13	,, ,,	Negri Sembilan.
1	—	1	,, ,,	Johore.

There were 12 criminal lunatics and 2 lunatic criminals under treatment on December 31st, 1903; 9 criminal lunatics and 8 lunatic criminals were admitted during the year, making a total of 31 criminals treated; of these three were discharged recovered, 6 on expiry of sentence were transferred as ordinary patients, 4 died, and 14 criminal lunatics and 4 lunatic criminals remain under treatment.

Evidence of past and present venereal disease in the admissions, as in previous years, is common. Over 24 per cent. had suffered from syphilis, a percentage that has gradually increased from the 13·48 per cent. of the 1896 admissions. Syphilis was the undoubted cause of the insanity in many of the cases, and was the cause of death in 8 cases, 3 being due to gumma in the brain.

Beri-beri.—From October 13th, 1903, to October 13th, 1904, all patients were fed on the cured Bengal rice, and during this period but one case of beri-beri occurred in the asylum, a case attacked early in November, 1903. During this same period the disease was epidemic in the Singapore gaol, and formerly when epidemic in the one institution it was invariably epidemic in the other. On October 13th, 1904, we returned to the uncured Siam rice, and in December 15 cases of beri-beri arose, coming from all parts of the asylum, though none occurred amongst the 20 males and 8 females kept on Bengal rice as controls. I am far from being convinced that the consumption of the uncured rice is the cause of beri-beri, and have yet several experiments to complete; but my experience of the past few years, since making researches into the subject, certainly tends to make me far less antagonistic to the theory than formerly. My work is not yet ready for publication, but shortly I trust to have some results to bring forward.

In the early part of the year some of the underground drains in the lower levels of the asylum became blocked, and at the same time an epidemic of dysentery and diarrhœa broke out. In all there were 47 cases of bowels diseases with 9 deaths. The drains, after some delay, were dug up, substituted by surface drains, and the health of the asylum improved.

Towards the end of the year the asylum became considerably overcrowded, a possible factor in the outbreak of beri-beri, and the health of the patients suffered, many being attacked with dysentery and diarrhœa.

I am happy in being able to state that it has been decided to construct a new asylum upon modern and sanitary lines as soon as possible, and an excellent site with sufficient land for a farm has been chosen.

Admissions.—Two hundred and twenty-three males and 31 females have been admitted during the year; of these, 22 males and 7 females were readmissions.

One hundred and sixty-six males and 24 females came from Singapore, 21 males and 2 females from Penang, 17 males and 1 female from Malacca, 4 males and 3 females from Province Wellesley, 11 males and 1 female from Negri Sembilan, and 4 males from British North Borneo.

The physical condition of those admitted was in a large number of cases deplorable, as is usual here. Of the 254 admissions, 85 were chronicled as physical condition impaired, and 47 as greatly impaired. Of these latter, 15 died before they had been in residence a month.

Discharges.—One hundred and four patients have been discharged recovered, equal to a recovery rate of 40·94 on the admissions. This is a marked improvement upon last year, and must be considered satisfactory.

Twenty-three patients were discharged relieved and 11 not improved to the care of their friends. A far larger number of patients are fit to be discharged in this way, but their friends and relatives are in China, and we have no means of communicating with them.

Deaths.—Forty-eight males and 11 females died during the year. The percentage of deaths on the average number resident was 22·01, the lowest since 1893.

Forty *post-mortem* examinations were held and the results recorded.

Industries.—During the year there have been manufactured 3,792 yards of cloth and 33 blankets. From the cloth there have been made 745 pairs of trousers, 656 jackets, 261 women's jackets, 163 sarongs, and 108 dusters.

About 80 per cent. of our inmates are usefully employed, every encouragement in the way of small luxuries such as tobacco, fruit, &c., being given them to this end.

Maternity Hospital.

Report by Mr. N. A. Wray, Assistant Surgeon in Charge.

The buildings are in good order. Four additional dwelling-rooms were erected during the year for servants.

Whitewashing, tarring and painting were carried out during the year.

Dr. Fowlie continued to render his valuable services to the hospital.

Mrs. Hennessy, the matron, has done very good work.

One probationer, Mrs. Massabini, passed her examination and received a diploma as midwife. Mrs. White is still under training.

The number of admissions (72) shows a decrease of 13 on last year, but as the hospital was closed from March 23rd to May 23rd owing to a case of septic-

æmia occurring in the hospital, the numbers compare favourably with previous years.

The following table shows the work done during the year:—

Nationality	Remained	Admitted	Total	Discharged	Died	Remaining
Europeans ..	1	28	29	29	..	..
Eurasians ..	..	4	4	4	..	..
Tamils ..	3	25	28	28	..	..
Chinese ..	..	10	10	8	2	..
Hebrew ..	..	4	4	4	..	..
Singhalese ..	..	1	1	..	1	..
Total ..	4	72	76	73	3	..

The three deaths were due to (1) septicæmia, (2) shock on rupturing membranes in a case of placenta prævia, and (3) from beri-beri and peritonitis, the patient, a Chinese, having been, it was said, in labour for nine days before seeking admission.

The average daily number in hospital was 2·02.

Of the 66 labours in hospital, 53 were natural, 4 were difficult, 8 were preternatural, and one was complex.

There were 3 cases of placenta prævia. The first, a Singhalese lady, died of septicæmia, the second, a Chinese, succumbed to shock, on rupturing the membranes, and the third, a European, came in early and made a good and rapid recovery.

There was one case of foot presentation and one of breech. There were also one case each of partial inversion of the uterus and premature detachment of the placenta. Forceps were used in three instances. There was one case of abortion in the fifth month.

Hæmorrhage occurred in five cases, three unavoidable (placenta prævia) and two accidental (partial inversion of the uterus and premature detachment of the placenta).

Of the 66 births, 57 children were born alive, 8 were stillborn and 1 prematurely, the sexes being 30 males and 36 females.

PENANG.

Report by Dr. T. C. Mugliston, Colonial Surgeon.

The public health of Penang for 1904 has been up to the average of previous years, and judging from the total number of deaths registered and by the death-rate per mille of the estimated population, though not so good as 1903, was better than that of the year 1902.

The total number of deaths registered was 5,517, as against 4,988 in 1903, and 5,787 in 1902; of the total number of deaths registered, 4,222 were within municipal limits and 1,295 in country districts. On an estimated population of 130,602, this gives a crude mortality of 42·24 per mille. Eliminating the deaths at Pulau Jerejak (Leper Asylum 140, quarantine station 6, and of those dying shortly after arrival in the colony, 309; town 279, country 30), the corrected death-rate for the island comes to 38·75; 40·49 per mille for the population within municipal limits, and 38·06 per mille for the country.

Zymotic disease in epidemic form was absent; small-pox, 3 cases only occurred in the town; 16 cases were imported and removed from vessels; of these 19 cases, 7 died. Chicken-pox—there were 66 cases (8 cases imported); measles 9 cases.

Cholera.—No cases were reported; 5 cases were imported and treated on Pulau Jerejak.

Enteric Fever.—One hundred and thirty-eight deaths were registered. According to hospital statistics, there were 10 admissions, with 6 deaths.

Plague.—Two cases occurred among a ship's crew, both cases were removed to the quarantine station, Pulau Jerejak, and died; the diagnosis was confirmed bacteriologically. No cases occurred in the town or country.

The infant mortality for 1904 was rather high, the number of infants dying under one year being 704, or 12·75 per cent. of the total number of deaths registered, and 28 per cent. of the total number of births registered. Referring back to the records for ten years, the number of infants dying last year is the highest, while the percentage to the total number of deaths registered comes second to the year 1899. Tetanus neonatorum accounts for about 19 per cent. of those infants dying under three months.

On the retirement of Assistant Surgeon O'Keefe on pension, Dr. Edith Boomgardt, L.R.C.P. & S.(Edin.), &c., was appointed Deputy Registrar of Deaths. During the first three quarters of the year 1904 the percentage of unclassified "fever" cases to the total number of deaths registered in municipal limits approximated 3·84 (first quarter 1·30 per cent., second quarter 1·26 per cent., third quarter 1·28 per cent.); in the fourth quarter, the percentage of such "fever" cases to the deaths registered in municipal limits is ·78. Under the present careful investigation the vague item of "fever" is much curtailed, and returns are much better and fuller than formerly, and more care is taken in arriving at the cause of death. I have only referred to deaths within municipal limits; the majority of deaths (nearly 95 per cent.) registered in country districts are returned as "fever." If these unclassified "fever" cases, which are returned by the police, are eliminated, it will be seen that the number of unclassified "fever" cases in the town is almost *nil*.

General Hospital.

Report by Dr. G. D. Freer, Colonial Surgeon, Resident.

The total number of cases treated was 2,117, and the number of deaths 86, as compared with 1,866 and 87 respectively for the previous year.

The average daily sick was 58·53, and the percentage of deaths 4·06.

European Wards.—There were 208 admissions in all, of whom 26 were females. The chief diseases treated were malarial fever 51, venereal disease 14, dengue 11, typhoid fever 5, diarrhœa 5, pneumonia 2, bronchitis 2, injuries 5, alcoholism 6.

Native Wards (excluding police).—The number of admissions was 1,171 (females 104) and deaths 72. The chief causes of admission were: Injuries 396, malarial fever 127, mental diseases 88, venereal diseases 69, alcoholism 46, ulcers 44, beri-beri 30, diarrhœa 25, dysentery 22, bronchitis 28, pneumonia 18.

Colonial Medical Reports.—No. 21.—The Straits Settlements (*continued*).

One hundred and thirty-five Indian immigrants were sent for treatment from the Indian Immigration Depôt, and sixty-five Sinkehs from the Chinese Protectorate.

Eighty-two cases were sent for observation as to sanity, of whom 21 were transferred to the Lunatic Asylum, Singapore.

Native Police (including Malay States Guides).—The admissions numbered 686, against 495 for the previous year, and were made up as follows: Sikhs 355, Malays 297, Hindus 28, Chinese 6; of the Sikh admissions, 104 were from the detachment of Malay States Guides.

The principal diseases among them were malarial fever, 157; dengue, 45; venereal disease, 48; ulcers, 42; bronchitis, 34; dyspepsia and constipation, 31; diarrhœa and dysentery, 10; injuries, 19; pneumonia, 4. There were two deaths from pulmonary tuberculosis and malarial cachexia respectively.

Two hundred and thirty recruits were sent for examination, 155 were passed and 75 rejected.

Eighty men were boarded as unfit for further service.

Dengue.—Out of a total of 71 cases admitted to the General Hospital, 64 were in the months of June, July, and August. Among the police stationed in the Fort it was at one time exceedingly prevalent, hardly a man escaping, and it is interesting to note that out of the total (71), 45 cases were Sikh police stationed in the Fort, while from the Malay States Guides stationed at Sepoy Lines there were only two admissions; also, out of 11 European admissions, 8 were policemen living in the Fort. At the same time, although these cases were not specially isolated in hospital none of the other patients nor any members of the hospital staff contracted the disease. The above rather points to the conclusion that dengue is not infectious in the ordinary meaning of the word, and is in favour of Dr. Harris Graham's theory (mentioned in Manson's "Tropical Diseases") that, like malaria and yellow fever, dengue is communicated by a species of mosquito acting as an intermediary. No doubt the Fort moat forms an excellent breeding ground for many species of mosquitoes. There were no deaths from the disease.

Malaria.—As usual both in the general and pauper hospitals, malaria accounted for a large number of the admissions, and in many of these the diagnosis was confirmed by a microscopical examination. Out of a hundred consecutive fever cases, mostly Chinese pauper patients, I find that malarial parasites were found in 51. In 3 of these crescent bodies only were found; in 16 crescent and small signet ring parasites, in 24 small signet ring bodies only, in 4 benign tertian parasites, and in 4 benign quartan parasites. Out of the 51 patients in whom malarial parasites were found, 16 were found to have marked enlargement of the spleen, but in 20 of the others in whom no parasites had been found, the spleen was also found to be enlarged. From several of the latter specimens were obtained by splenic puncture and stained with a view of showing the Leishman-Donovan body, but in no case so far has this been discovered.

Operations.—The principal operations performed included: Excision of hip-joint, 1; amputation of thigh, 2; thoracotomy with excision of ribs for empyema, 3 (1 died); for abscess of liver, 5 (3 died); removal of tumour, 8; excision of lower jaw, 1; ligature of femoral artery, 3; trephining of skull, 2 (1 died); radical cure of hernia, 1; radical cure of hydrocele, 2; for strangulated hernia, 2 (1 died); external urethrotomy (Wheelhouse), 6; partial excision of rectum, 1; excision of eye-ball, 3; tracheotomy, 1; extraction of lens for cataract, 5; altogether 88 operations were performed under chloroform.

New Growths.—Seventeen cases of new growths were admitted into the general and pauper hospitals during the year. Specimens from seven of them were forwarded to the Cancer Research Society, but so far no report has been received as to their nature. The following are the probable diagnoses with the nationalities of the patients:—

Sarcoma of neck ...	5	all Chinese.
Sarcoma of orbit ...	1	Chinese.
Carcinoma of liver ...	1	Eurasian.
Carcinoma of pancreas	1	Eurasian.
Carcinoma of rectum	1	Hindu.
Epithelioma of penis	3	2 Hindus and 1 Chinese.
Epithelioma of lip ...	1	Malay.
Epithelioma of sebaceous cyst of scalp	1	Chinese.
Fibroma of breast ...	1	Chinese.
Fibroma of thigh ...	1	Sikh.
Hernia testis (probably gummatous) ...	1	Chinese.

Medico-Legal.—One hundred and thirty-six bodies were sent for *post-mortem* examination and inquest. I am glad to say that since the completion of the new "Morgue" in December, dead bodies are now sent there instead of to the hospital mortuary, a most desirable change for many reasons.

Prison Hospital.

Report by Dr. T. C. Mugliston, Colonial Surgeon.

During the year there were 4,705 admissions into prison, as against 3,674 for 1903, the daily average prison population being 421·92.

The admissions to hospital, excluding these detained under forty-eight hours for trivial complaints or observation numbered 155, giving an average daily sick of 6·97, and a daily sick rate of 1·65 of the prison strength.

There were 11 deaths in the prison during the year (five in the first three quarters and six in the last quarter) which is equivalent to a mortality of 7·09 per cent. of those admitted to hospital and 2·34 per mille of the admissions to prison.

The 11 deaths were due to the following causes:—

Malarial fever	1
Phagedæna	1
Debility	5
Tubercular phthisis	2
Chronic diarrhœa	2

Of the total admissions to the prison, 296 bore traces of or were actually suffering from venereal disease; 285 prisoners showed marks of a course of morphia injections, and 76 were confirmed opium smokers.

Vaccination of all prisoners who had not been previously vaccinated or revaccinated, or who bore no marks of a previous attack of small-pox, was performed this year on 423, with a percentage of 80·77 successful cases to total vaccinated.

Vaccine lymph from Saigon was used in all cases.

Pauper Hospital.

Report by Dr. G. D. Freer, Colonial Surgeon Resident.

Buildings.—New quarters for the senior dresser were built during the year. The attap roof of Ward 3 was replaced by a tiled one, the wooden supports replaced by brick pillars, and the floor renewed. The floors of Wards 2, 9, and 10 were reconcreted and cemented, and the wooden flooring of ward and verandahs in the pauper female ward replaced by solid concrete and cement.

Staff.—I took over charge from Dr. Jamieson on March 5th, on my return from leave. Assistant Surgeon C. T. de Souza was transferred to Malacca on July 23rd, being replaced by Assistant Surgeon C. J. Bateman on August 15th, Assistant Surgeon T. J. Scully acting in the interval.

Work Done.—The total number of patients treated was 4,010, of whom 400 remained from the previous year, the average daily sick 392·02 and the percentage of deaths to total treated 20·14, compared with 3,986, 364·59 and 17·76 respectively in 1903. Forty-one patients died within twenty-four hours and eighty within forty-eight hours from the time of admission.

In the female ward twenty-four patients remained in December 1903, and 121 were admitted during the year, making a total of 145.

Table A shows the admissions and deaths from the principal diseases for the past four years. It will be seen that there was a very considerable increase in the number of beri-beri cases, the admissions and deaths being nearly twice as many as in the previous year.

Table B shows the admissions and deaths of different nationalities for beri-beri, together with the rainfall for each month of the year. An inspection of this will show that contrary to the usual rule observed here, there was no increase in the number of cases admitted during the wet autumn months.

Fifty-two lepers were admitted during the year, of whom forty-six were transferred to the Leper Asylum.

TABLE A.

Table showing Admissions and Deaths from the Principal Diseases for the past Four Years at the Pauper Hospital, Penang.

Diseases.	1901			1902			1903			1904		
	Cases Treated	Deaths	Percentage	Cases Treated	Deaths	Percentage	Cases Treated	Deaths	Percentage	Cases Treated	Deaths	Percentage
Malarial Fever ..	440	68	15·45	418	39	9·33	342	24	7·01	334	36	10·77
Beri-beri	424	134	31·60	382	121	31·67	275	69	25·09	512	134	26·17
Dysentery	138	56	40·57	101	56	55·44	91	40	43·95	86	40	46·51
Diarrhœa	431	219	50·81	480	250	51·97	408	191	46·81	332	188	56·62
Debility	246	63	25·60	168	79	47·02	235	108	45·95	265	91	34·33
Pulmonary Tuberculosis	158	95	60·12	234	110	47·00	205	115	56·09	207	132	63·76
Anæmia	210	54	25·71	249	5	3·35	113	23	20·35	129	24	18·60
Venereal Diseases..	711	38	5·34	653	32	4·90	681	26	3·81	581	35	6·02
Total Cases Treated, with Deaths ..	4,415	839	19·00	4,055	814	20·07	3,986	708	17·76	4,010	808	20·14

TABLE B.

Table showing the Admissions and Deaths, Pauper Hospital, Penang, for Beri-beri for the Year 1904.

Nationalities	January		February		March		April		May		June		July		August		September		October		November		December		Total	
	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths	Admissions	Deaths
Chinese ..	34	2	40	4	46	9	34	10	46	17	35	9	51	15	35	9	32	16	22	14	24	14	36	12	435	131
Klings ..	2	..	4	..	..	1	2	..	2	1	3	..	1	..	1	1	2	..	1	..	..	..	2	..	20	3
Rainfall ..	9·76		2·02		3·88		9·70		7·72		4·24		9·12		26·33		14·64		21·30		10·65		3·99		123·35	

PROVINCE WELLESLEY.

Report by Dr. W. H. Fry, Colonial Surgeon.

The estimated population for Province Wellesley for 1904 is 117,762, compared with 117,078 in 1903.

This is computed to be as follows :—

Europeans	186	Malays	69,370
Eurasians	304·5	Indians	19,919
Chinese	26,889·5	Other Nations	1,093

The *births* numbered 3,778, compared with 3,813 in 1903, being 32·08 per mille of population, compared with 32·58 in 1903.

The *deaths* were 3,392, compared with 3,279 in 1903, being 28·79 per mille of population, compared with 28·02 in 1903.

The number of deaths among infants from worms and convulsions continues very high, being no less than 741 from both causes for the entire province; in consequence of this a circular was in September issued to all police-stations and Penghulas detailing the chief symptoms and signs of worms, their causes, and treatment to be adopted. It is possibly in consequence of this that the death-rate from these parasites has in the northern district sunk from an average of 16 to 10 per month, and in the central district from 5 per month to 3 only. I have no doubt, however, that unless the circular is continually brought to notice the benefit will not be permanent.

The number of cases admitted to hospitals throughout the whole province was 1,588, with 208 deaths, compared with 1,469 cases and 241 deaths in 1903; this being a death-rate of 13·09 per cent. of admission to hospital, compared with 16·40 per cent. in 1903.

Zymotic Disease.—Comparatively few cases of small-pox occurred in the province during the year; this was anticipated from the number of cases (258) of this disease in 1903, it having been observed that an unusual number in one year is usually followed by one or two years' remission of the disease.

Some few cases of chicken-pox were reported, chiefly in the neighbourhood of Prai and Butterworth.

Dengue fever occurred throughout the province, but to no great extent, such few cases as sought admission to hospital did so for the rheumatic pains and other sequelæ of the disease.

The cases of small-pox numbered 6 with 2 deaths, and of chicken-pox 7 cases with no deaths.

Of the above, 9 were treated at the General Hospital, Butterworth.

One case of small-pox which afterwards proved fatal was too ill to be removed from his house when first seen. None of the persons affected had been revaccinated since infancy.

The nationalities of those affected comprised 7 Hindus and 6 Malays, 9 being males and 4 females.

General Hospital, Butterworth.

Work Done :—

Remained from 1903	34
Admitted...	479
Discharged	391
Tranferred	6
Absconded	17
Died	55
Remained at end of 1904	44

Of the 55 deaths, 7 occurred within twenty-four hours of admission.

Number of males admitted 426; died 428. Number of females admitted 53; died 7.

Average daily number of sick, males 42·35 and females 3·08.

Percentage of death to total treated was 10·72, or excluding those that died within twenty-four hours, 9·31.

The chief diseases treated comprised :—

Venereal Disease ...	58 with two deaths.
Ulcers	51.
Wounds and Injuries...	42.
Diarrhœa	35 with 15 deaths.
Intermittent Fever ...	21.
Beri-beri	19 with 3 deaths.
Dysentery	9 with 3 deaths.

Operations.—Forty-nine operations were performed, chiefly of a minor nature.

Venereal Disease.—Of those admitted with venereal disease, eighteen stated that they had contracted the disease from Chinese or Japanese prostitutes residing at Campbell or Cintra Streets, Penang. I shall again refer to this subject later on.

Government District Hospital, Bukit Mertajam.

Work Done :—

Remained from 1903	37
Admitted...	605
Discharged	474
Transferred	16
Absconded	11
Died	99
Remained at end of 1904	42

Of the 99 deaths, 17 occurred within twenty-four hours of admission. Average daily number of sick, males 46·82 and females ·80.

The chief diseases treated included :—

Ulcers	99 with one death (from exhaustion).
Venereal Disease ...	79 with three deaths.
Beri-beri	54 with 21 deaths.
Malarial Fever ...	43 with 5 deaths.
Debility	47 with 8 deaths.
Rheumatism	37.
Dysentery and Diarrhœa	34 with 11 deaths.

Province Wellesley, Southern Division.

Report by Dr. A. H. Keun, Colonial Surgeon.

The hospitals in the Southern Division of Province Wellesley are four in number, viz., the Government District Hospital at Sungai Bakap, and the three Estate Hospitals of Batu Kawan, Caledonia and Byram.

The Government District Hospital, Sungai Bakap.

During the year the general wards and outhouses were whitewashed and damar varnished, while the Colonial Surgeon's quarters were re-roofed and various petty repairs executed in all the hospital buildings.

An attempt was made at repairing the Contagious Disease Ward, but owing to the dilapidated condition of the building it was deemed advisable to include a new shed in next year's estimates.

Water supply remains as before, and is from surface wells, the drinking water well being within the hospital grounds, and the well for washing purposes in a Malay Campong within 200 yards of the hospital. The supply continues good and abundant.

Work Done.—On January 1st there were 23 cases under treatment in hospital. The admissions during the year amounted to 504, forming a total of 527 treated. This shows a distinct advance on the previous year, when 342 cases in all were treated. There were 54 deaths, giving a percentage of 10·24. This compares most favourably with the 56 deaths of last year, with its percentage of 16·37 to the total treated. Of these 54 deaths, 4 took place within twenty-four hours. The principal diseases treated were general and local injuries with 74 cases and 3 deaths (2 from exhaustion after severe scalds and 1 from pyæmia in a compound fracture of tibia case). Ulcers came next with 40 cases. As is usual in the province, diarrhœa accounted for a number of admissions, viz., 33, of whom 11 died, making a percentage to total diarrhœa treated of 33·3. This contrasted with the 66·85 per cent. (of deaths from diarrhœa to total diarrhœa treated) of last year shows a distinct improvement. Rheumatism of a subacute nature accounted for 28 admissions with no deaths. Malarial fever 29 (no deaths); anæmia, 30 cases with 7 deaths; debility, 17 cases with 3 deaths; leprosy, 11 cases; acute pneumonia caused 9 admissions with two deaths; and cirrhosis of liver 6 admissions with 2 deaths. From the returns of the Government District Hospital as well as from the returns of the various Estate Hospitals in the South Province, it will be seen that while diarrhœa continues, a factor accounting for large admissions and high mortality, there is on the whole a distinct improvement everywhere. The Tamils are especially susceptible to this disease. The gastro-intestinal canal appears to be the most vulnerable point of a Tamil. Various are the theories to account for the prevalence of the disease in the estates, and the water supply has again and again been held responsible for the disease. It was with the object of removing this source of danger that the Penang Sugar Estates erected water boilers and sterilisers to supply boiled and sterilised water to the coolies in all their estates in the province. In addition sterilisers were put up in the hospitals for hospital use. Boiled water has been in use since April, 1903. As a result this year saw a distinct decrease in the admissions from diarrhœa and dysentery. However, other factors besides the drinking water are responsible for bowel disorders. Among the most prominent I would place the long hours many of the coolies have in the fields exposed to all sorts of weather; the imperfect nutrition which of necessity many of them have owing to their having to cook their own dinners on their return home after 5 p.m. or so, when too exhausted and depressed, many prefer to feast on cakes and other innutritious food and filth sold in the Kuchis; but above all the very chilly evenings and nights play a most important part in filling our hospitals. Many of the coolies have to sleep on the bare ground, sometimes on planks resting directly on the ground. In the early morning there is always a distinct fall in the temperature, and the damp cold ground extracts the heat from the bodies lying over it. This leads to a chilling of the system, which among the Tamils manifests itself by bowel disorders. But the predisposing causes are equally important. In many of the batches that have arrived, the managers state, are weak coolies who are unable to resist intestinal disease and who succumb to the first attack. To attempt to fix on one cause as the chief factor in the causation of this disease is impossible, and in the consideration of the causation of the disease the one fact must always be borne in mind that in the Tropics the bowels are the organs most susceptible to disorders, and such disorders are frequent from injudicious dietary, impure water, chills, exposure, or excessive exhaustion.

Hospital Staff.—I was in charge during the whole year. There was no Assistant Surgeon in the hospital during the whole year; third grade dresser S. Dorasamy did very good work, while Mr. A. Moses ably seconded him.

Batu Kawan Estate.

Under the management of Mr. Lamb, a series of improvements was effected in the hospital buildings and outhouses. New roofing to all the wards (except the Chinese and Middle Wards) and new bertam sides were fixed. Improvements were also effected in the coolie lines. A few lines were rebuilt and an innovation of distinct value, viz., raised platforms for beds, &c., made. On September 18th, a gang of scavengers was organised to attend to the scavenging of the lines. Previous to this date the work was done by the general body of the coolies on Sundays. The estate employs free and indentured coolies, the latter include Tamils, Japanese and Chinese, each living in their own special lines at a distance from each other.

The strength of the working element is as follows:—

Indian Immigrants and Second Contract Coolies	162
Free Tamil Coolies	252
Javanese Coolies	52
Tamil Kongsi Coolies	350
Chinese	70
Total ...	886

The *water supply* continues the same as previous years, and was ample during the whole year. For the convenience of field workers fresh water is conveyed in boats daily to the fields for drinking purposes.

Hospital Staff.—Mr. Thomas continued as dresser in charge and his work generally was excellent. At present he has no assistant under him.

Tamil Patients.—On January 1st there were 14 Tamil patients. There were 239 admissions, making a total of 253 cases treated. There were only 3 deaths, one from tetanus, one from diarrhœa, and one from child-birth. Mortality, 1·18 per cent.

Chinese Patients.—On January 1st there were 5 Chinese patients. There were 36 admissions, making a total of 41. No deaths occurred among them in hospital.

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Javanese Coolies.—The year only saw 17 admissions with no deaths. Among the Tamils ulcer was the prevailing disease, 88 cases; febricula came next, 55 cases with no deaths; diarrhœa next, 28 cases with one death; chicken-pox, 14 cases no deaths; gonorrhœa, 10 cases.

Among the Chinese diarrhœa came first, 6 cases with no deaths; ulcers, 6 cases; anæmia, 4 cases no deaths; and among the Javanese coolies rheumatic pains accounted for 4 admissions, and diarrhœa for 3.

In studying the diseases occurring among the different nationalities, it is interesting to note that diarrhœa is prevalent among them all, though more so among the Tamils. That the Chinese should suffer shows that the water cannot be the only cause, as Chinese scarcely ever drink cold water. Hot water and hot weak tea are their universal drinks, even on the estates. The decline in the mortality of diarrhœa is well shown in the following table of mortality.

	1901		1902		1903		1904		
	Tamil	Chinese	Tamil	Chinese	Tamil	Chinese	Tamil	Chinese	Javanese
Diarrhœa	149	..	111	6	63	16	28	6	3
Death Percentage..	20·80		16·23		6·32		3·57		

Caledonia Estate Hospital.

Various repairs were executed in the hospital buildings, but of a petty nature. The drainage of the hospital remains the same.

Water Supply.—Last year the boiling apparatus erected in Caledonia was completed, and this has since been in use during the whole year; about 9,000 gallons of water a day are boiled, and this water is conveyed in pipes to both the Caledonia and Victoria Kuchis, where it is stored in iron cisterns. These cisterns are cleaned about twice a month. Water is to be found in them at all hours of the day and night, ample in quantity for all the coolie uses. A few standpipes on the roadside gave a liberal supply. While the water supply is ample for all purposes, one cistern and one outlet or tap only for each Kuchi are wholly inadequate. The hospital steriliser is also in use for hospital purposes. There was a temporary stoppage from October to November, owing to leakages. The water used is obtained from the Jawi stream before it reaches the coolie lines.

Hospital Statistics.—During the year, 1,508 cases were treated in the hospitals, with 46 deaths, giving a percentage of 3·05. This contrasted with the 1,433 cases treated in 1903, with 75 deaths (5·23 per cent.), shows a distinct improvement in the mortality of the estate. The admissions to this estate hospital are chiefly from Victoria and Caledonia Estates, while Krian Brick Fields have supplied three patients. It is interesting to contrast the various admissions with reference to nationalities, and the mortality of the separate estates. It is at once seen that Victoria Estate has supplied the largest number of Tamil patients and the highest mortality. This is accounted for by that estate receiving most of the newly arrived indentured coolies, and it is among such men, who arrive debilitated after their sea-voyage, and are put at once on field duty, unaccustomed to the climate and perhaps to the food, that gastro-intestinal diseases, which perhaps accounted for most admissions, do most mischief.

	Diarrhœa	Deaths	Dysentery	Deaths
Victoria Tamils..	145	6	53	6
Caledonia Tamils	44	1	20	3
Javanese.. ..	23	..	4	1
Bengalis	5	..	1	..
Total ..	217	7	78	10

In 1903, diarrhœa and dysentery, for both estates, accounted for 356 admissions, with 41 deaths (11·5 per cent.). In 1904, the total admissions for diarrhœa and dysentery were 295, with 17 deaths, giving a percentage of 5·7. This speaks in itself of the distinct improvement in the health of the estates, and shows that diarrhœa and dysentery are not the formidable diseases they used to be. Of these admissions for diarrhœa and dysentery, 118 cases came from Victoria, with 12 deaths, and 64 from Caledonia, with 4 deaths, the percentage of mortality being practically the same in the two estates (a little over 6 per cent.). The other diseases treated were local and general injuries, 263 cases; intermittent fever, 136; simple continued fever, 65; gonorrhœa, 84; ulcers, 44; bronchitis, 39.

Hospital Staff.—Dr. Ellery, the Estate Medical Officer, was in charge during the whole year. The staff remains the same as in the previous year, viz., two experienced dressers, one apprentice dresser, and a number of attendants.

The Cook-houses, which I referred to in last year's report, did excellent service this year. Every indentured coolie must take his meals here during his first month on the estate; afterwards he may continue at his own pleasure. There is an average of about ninety coolies at the tables. A cup of hot kanji is served out to the indentured coolies every morning before proceeding to the fields, for which a small charge of half a cent or so is made. This is a measure of great value, as otherwise the coolies would have to go out every morning into the cold, chilly air on an empty stomach, or after partaking of cold rice left over from the meal of the night before.

Byram Estate Hospital.

Various petty repairs were done to the hospital buildings. The hospital latrines were improved. A new ward for infectious diseases was erected, and found serviceable in the measles outbreak this year.

Water Supply.—The hospital boiling apparatus was in constant use during the year. A new steriliser to

supply sterilised water to the whole estate was completed and was in use during the year with only a stoppage of a month. As mentioned in my last year's report, the water is brought up in water-boats from the Jawi Canal, near Caledonia.

Work Done.—On January 1st, 1904, there were 33 cases in hospital. During the year there were 690 Tamil admissions, making a total of 720 Tamils treated, and 305 Javanese, 1,025 in all. There were 23 deaths among Tamils, and 5 among Javanese, 28 in all, forming a percentage of 2·73 to the total treated. Last year there were 18 deaths out of 1,038 cases treated (or 1·73 per cent.).

The principal diseases treated were :—

	Tamil.	Deaths.	Javanese.	Death.
Diarrhœa ...	98	7	24	*Nil.*
Dysentery ...	76	7	27	1
Intermittent Fever	141	—	34	—
Bronchitis ...	24	—	1	—
Colic	12	—	7	—
Gonorrhœa ...	39	—	100	—
Ulcers	72	—	20	—
Local and General Injuries ...	51	—	10	—
Confinement ...	13	—	1	—
Chancres ...	23	—	7	—

The chief feature of the returns of the estate is the number of admissions from venereal disease, especially among the Javanese.

This year saw the commencement of Javanese immigrant labour. Four hundred and three coolies (males 222, females 181), arrived in the estate; of these 100 were found suffering from gonorrhœa and 7 from chancres, or 26·5 per cent. of all arrivals. Immediate steps were taken to examine all the arrivals to isolate the infected ones. While there has been a decrease in the admissions from diarrhœa and dysentery the death-rate has slightly increased, thus :—

1903—291 cases of diarrhœa and dysentery with 16 deaths.

1904—225 cases of diarrhœa and dysentery with 15 deaths.

Krian Brick Fields.

The health of the coolies employed here has always been excellent, and this year only saw three admissions into hospital with no deaths.

Public Health.—This year has been practically free of all epidemics except little outbreaks of measles in Byram and Caledonia Estates, and in Batu Kawan.

Small-pox.—Not a single case occurred in the south province. It is, however, of very great importance to consider the vaccination question of the province. At the present time all children born in the district must be vaccinated within three months, failing compliance the parents are fined. But with a partial wandering population as we have in the province, where many natives migrate from place to place in search of work or to turn their hands to various occupations in various districts, children are often carried by their parents into other districts, and so pass out of the notice of the police and the public vaccinator. In this way large numbers escape vaccination. Parents, while they are becoming conscious of the prophylactic action of vaccination and its beneficial effects in modifying cases of small-pox, still look for the most part on vaccination as a painful operation, and so avoid bringing their children up for vaccination. With such a rich soil for the small-pox germ, it is not surprising that when a few cases of small-pox occur the disease soon spreads and too often reaches epidemic proportions, and the mortality is proportionally high. The only remedy appears to me to lie in the hands of the police. The local police should at once communicate with the police of the district where the natives have gone to, and the information should be sent to the superintendent of vaccinations of that district. It would not be a difficult matter for the police to ascertain the districts the parents have gone to, from friends and neighbours, and in this way a great irregularity could be remedied. The subject of revaccination is also of great importance. While outbreaks of infectious diseases everywhere are always serious in an estate where natives are more intimately in contact with each other, outbreaks are of very great importance owing to their rapid spreading and high mortality. Compulsory revaccination is a necessity. New immigrants should be revaccinated prior to leaving their country or on arrival. In this way one source of danger can be obviated. There was a little epidemic of chicken-pox in Batu Kawan, where 14 cases were treated with no deaths. There were 26 cases of measles treated in Caledonia Estate Hospital, all from Victoria Estate. In Byram, 31 cases of measles were isolated and treated, as well as 12 cases of chicken-pox.

Another subject of very great importance to the health of the community is the prevalence of venereal diseases among the natives. Unfortunately, hospital statistics will not emphasise the danger, as natives do not care to come into hospital to be treated for such diseases, which they know are not immediately fatal, while native treatment has apparently some beneficial results on them. Wandering prostitution is, in my opinion, chiefly responsible for this prevalence. Only the Japanese and some Chinese (Macao) prostitutes reside in recognised brothels. There are a very large number of Tamil and Malay prostitutes who wander from village to village, residing a few days only at each place, and shifting from street to street, and so avoid the complaints of their being nuisances being made by neighbours. Most of these women suffer from venereal diseases, and they are the means of spread of these loathsome diseases. Apparently there is no remedy short of special legislation.

The Sanitary Department is doing slow and steady work in the south province with corresponding improvement in the sanitation of the villages.

Appendix D.

MALACCA.

Report by Dr. F. B. Croucher, Colonial Surgeon.

The general health of the Settlement during 1904 was fairly satisfactory. With an estimated population at the end of the year of 98,878, the death-rate was

32·95 per mille against 33·81 per mille last year, and 31·19 per mille in 1902. The deaths in children under one year of age numbered 851, nearly 25 per cent. of the total.

The chief causes of death were returned as:—

Fever	1,307	against	1,405	last year.	
Convulsions	574	,,	735	,,	
Phthisis	168	,,	163	,,	
Intestinal Diseases ...	261	,,	116	,,	
Beri-beri	284	,,	184	,,	
Debility after Fever ...	97		—		
Old Age	274	,,	252	,,	
Pneumonia	49				
Phagedæna	19				

The total number of births during 1904 was 3,380 (males 1,741, females 1,639), compared with an average of 3,579 during the previous ten years. This gives a birth-rate of 34·19 per mille for the year, against an average rate of 38·34 per mille for the previous decade. Six hundred and thirty-five births (males 344, females 291) were registered within municipal limits.

The total number of deaths registered in the Settlement was 3,259 (males 2,042, females 1,217), as against 3,332 (males 2,008, females 1,324) in 1903, giving a death-rate of 32·95 per mille. Of the deaths, 672 occurred within municipal limits with an estimated population of 15,711, and 2,587 in the country districts. This gives a death-rate for the town of 42·77 per mille, and country 31.10 per mille.

The following were given as the chief causes of the deaths within municipal limits:—

Beri-beri ...	100	against	39	in 1903.	
Fever ...	96	,,	182	,,	
Phthisis ...	53	,,	61	,,	
Convulsions ...	75	,,	150	,,	
Diarrhœa ...	91 (chiefly in young children).				
Dysentery, 45, old age 64, pneumonia 26, premature birth, 18.					

The most noticeable feature in these figures is the increase in the number of deaths from beri-beri.

Small-pox.—One hundred cases of small-pox were recorded in the Settlement during the year with 7 deaths. The disease was generally of a very mild type. Fifty-nine cases occurred in persons previously vaccinated.

Dysentery.—Two outbreaks of dysentery of a very severe type occurred, one in Alei, about 5 miles from town, the other at Alor Gajah. Both were due to a shortage of drinking water, following on a period of very dry weather. At Alei, 52 cases were reported with 27 deaths. This mukim lies very low near the coast, and it is said that deep wells cannot be sunk as the water is saltish. The water for drinking is derived chiefly from shallow surface wells which are easily infected. Dresser Hosie was stationed at Kandang during the outbreak and did his best to aid the people, but I do not think they were ever convinced that the disease was due to the defective water supply. At Alor Gajah there were 27 cases reported with 8 deaths.

There was also a large increase in the number of patients suffering from beri-beri, the admissions being 437, as against 251 cases in 1903. The number of deaths from the disease was 89, against 64 last year.

The other principal diseases treated were malaria, 296 with 5 deaths; rheumatism, 174; diarrhœa, 85 with 24 deaths; dysentery, 74 with 31 deaths; phthisis, 61 with 28 deaths: phagedæna, 49 with 20 deaths; pneumonia, 26 with 15 deaths; syphilis, 85 with 2 deaths; injuries, 99 with one death; nephritis, 24 with 6 deaths; ulcers, 737.

Eighteen prostitutes suffering from venereal disease were admitted during the year.

Operations.—Sixty-nine operations were performed with 4 deaths (amputation of thigh, amputation of leg, resection of intestine for strangulated hernia, and gastrostomy for stricture of œsophagus).

Necropsies.—Ninety-four were made during the year.

Gaol Hospital.

The general health of the prisoners, with the exception of an outbreak of dysentery in October, was satisfactory. The average daily number of prisoners was civil, 5·54, and criminal, 46·56.

Buildings, &c.—The wells were closed early in the year and water from the Ayer Keroh Reservoir laid on. Ventilators were fixed in the lower part of all the cell doors.

Patients in Hospital:—

Remained	*Nil*
Admitted	30
Discharged	24
Died	6
Transferred	*Nil*
Remaining end of the year	*Nil*

Thirty-seven prisoners suffering from beri-beri who had been sent from Singapore in 1903, were still remaining at the beginning of the year. Of these, 3 died, 3 were discharged, and the remainder, much improved in health, were sent back to Singapore. Twenty-nine more were sent here in October. Of these, 2 died, 4 were discharged, and 23 remained at the end of the year.

There was an outbreak of dysentery in October affecting ten of the prisoners, the dresser in charge, and one of the warders. The first case attacked succumbed after two days' illness, and at the *post-mortem* examination there was found extensive gangrene of the large intestine. All the other cases did well with the exception of the warder, who was treated at his own home and died after about four weeks' illness.

The origin of the outbreak remained a mystery; it could not with any likelihood be put down to the water or food supply or to defective sanitary arrangements. Dust is given as one of the means by which dysentery was conveyed. Shortly before the outbreak, owing to the collapse of one of the buildings, excavations were made in the prison yard, and a large amount of sand and subsoil water was thrown up on to the surface. If any dysenteric pronouncing organisms were included it is possible that this was the way in which the disease was produced.

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MEDICAL REPORT FOR THE YEAR 1905.

METEOROLOGICAL RETURN FOR THE YEAR 1905.

	Temperature						Rainfall		Wind		Remark
	Solar Maximum	Minimum on Grass	Shade Maximum	Shade Minimum	Range	Mean	Amount in Inches	Degree of Humidity	General Direction	Average Force	
January ..	155° F.	..	85° F.	62° F.	23° F.	70° F.	·14	59	N.E.	Light	Records taken in shade, except solar maximum, during Jan., Feb., Mar., Nov., Dec.
February ..	150	..	86	70	16	77	·075	68	N.E.	Moderate	
March	160	..	89·5	75	14	80	·605	76	N.E.	Light	
April	..	..	93	74	19	84	1·05	76	N.E.	Light	
May	140	..	96	80	16	88	·02	73	S.W.	Light	During May records taken indoors. During July and August taken indoors in draught of air.
June	140	..	99	84	15	92	..	43	S.W.	Strong	
July	144	..	113	90	13	97	..	52	S.W.	Strong	
August	140	..	112	85	27	97	·01	35	S.W.	Strong	
September ..	142	..	111	77	34	88	·21	45	Variable	Light	Records from September taken in shade.
October	140	..	95	73	22	84	..	73	N.E.	Strong	
November ..	160	..	93	69	24	77	·10	60	N.E.	Strong	
December ..	165	..	86	61	25	69	·41	60	N.E.	Strong	
Mean of Year ..	..	..	95·7	75	20·7	92·1	·23	60	N.E.	..	

RETURN OF THE DISEASES AND DEATHS IN 1905 AT THE FOLLOWING INSTITUTIONS: BERBERA, BULHAR AND ZEYLA HOSPITALS.

	Cases.	Deaths.
GENERAL DISEASES—		
Small-pox	314	144
Febricula	3	..
Dysentery	115	1
Malarial Fever—	..	..
(*a*) Intermittent	1,007	..
(*b*) Remittent	117	..
Erysipelas	3	..
Tubercle	36	1
Chicken-pox	9	..
Syphilis—	..	..
(*a*) Primary	25	..
(*b*) Secondary	51	..
Gonorrhœa	327	..
Scurvy	56	..
Rheumatism	255	..
Rheumatic Fever	1	..
New Growths—	..	..
Non-malignant	4	..
Malignant	1	..
Anæmia	34	1
Debility	67	1
Whooping Cough	2	..
LOCAL DISEASES—		
Functional Nervous Disorders—	..	..
Paralysis	7	1
Epilepsy	6	..
Neuralgia	65	..
Hysteria	1	..
Neurasthenia	6	..
Diseases of the—	..	..
Eye	181	..
Ear	199	..
Nose	9	..
Circulatory System	21	1
Respiratory System	579	1
Digestive System	990	1
Lymphatic System	27	..
Urinary System	10	1
Male Organs	31	..
Female Organs	18	..
Organs of Locomotion	45	..
Cellular Tissue	78	1
Skin	3,793	1
Injuries, General	5	..
Injuries, Local	413	..
Surgical Operations	170	..
Poisons	7	..
Parasites	18	2

Estimated Population for the Year 1905.—The population during 1905 numbered—52 Europeans, 300,000 Africans, 200 Indians, 100 mixed and coloured persons. Except from an increase of 3 Europeans the number of people was the same as that for 1904.

The population at the present time is probably nearly stationary, as the outbreak of small-pox in 1904-5 and the emigration decrease are compensated for by the birth-rate. An estimation of the birth-rate as regards the coast towns shows this to be 10 per cent. among the married women. No figures are obtainable for the more remote portions of the country inland.

Death-rate.—No records on this are available.

Prevalence of the Disease at Different Seasons.—The table of statistics as regards the prevalence of the disease at the different seasons is apt to mislead, unless it is kept in mind that practically the entire native population emigrates into the interior during the extreme heat of the summer, leaving only those who are in fixed employment on the coast. The population able to present themselves at the hospitals thus varies from 20 to 30,000 during the winter, to 3 to 4,000 during the summer, and of this latter number the patients are confined to those drawn from the adult and more physically strong of the population.

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As regards the periods when sickness most generally prevails the spring and autumn are the more trying to the Somali natives. This is accounted for by the lack of provision for any variations in the temperature as regards clothing. The native dress remains the same at all seasons, and is of cotton only, while a blanket for use at night is not a common possession.

Among the Europeans resident in the country one observes that definite organic disease is uncommon, and except for the milder types of malarial fever and diarrhœa their diseases are entirely confined to the neurasthenic type, predisposed to by the physical conditions imposed on them by residence in such a hot climate.

In character the diseases of the country generally are not of an aggravated type, though undoubtedly the neurasthenic class of patients require invaliding in many cases before recovery takes place.

Relative Mortality at the Different Seasons.—January, February, and March are the months in which most sickness prevails, closely corresponding to the rainy season of the year as regards the coast.

Causes Affecting Public Health.—Meteorological: The hot, violent sandstorms which continue during the summer do undoubtedly lower the physical condition of both Europeans and natives alike. These hot winds seem to be responsible for most of the anæmic and debility cases. As regards other causes at work besides the meteorological, the general health is affected by the almost absolute absence of fresh vegetables among almost all classes over the greater part of the year. The natives do not cultivate, but live on camel's milk and meat, and occasionally on mutton. Camel's milk is also the chief source of salts in their food.

The poor Somali lives, therefore, very much, as regards his diet, on a par with some of the South American tribes, whose diet is almost exclusively animal, except for matté, a plant allied to and used as tea. Certainly directly the Somali is deprived of camel's milk he very quickly develops scorbutic symptoms. The natives as a race are total abstainers from alcohol, a very considerable asset as regards their physical condition.

Remarks on the Particular Diseases which have occurred during the Year.—Dysentery: All the cases which have come under my personal notice have been of an exceptionally mild type.

Malarial Fever.—The hospital figures show remittent fever on the coast to be exceptional. Of the different towns, Berbera is the one most affected by intermittent fever, probably due directly to the sufficiency of fresh water allowing a surface drainage and breeding ground for mosquitoes on the foreshore of the harbour. Mosquitoes seem to entirely disappear during the very hot months—that is, from May to October. Except for imported cases the towns of Bulhar and Zeyla are almost entirely free from malaria the whole of the year, due to the scarcity and expense of water leading to care and prevention of waste.

Insanity.—Cases of insanity of any of the recognised types are almost unknown, and but for syphilis most of the predisposing causes are absent. Cases of monomania, of which a few exist, do not readily become subjects for treatment at the protectorate hospitals.

Diseases of the Skin.—The large number of skin diseases recorded are accounted for under ulcers chiefly, these ulcers being on the legs and ankles of badly nourished subjects, and are of the usual tropical type.

A curious dermatological phenomenon is presented among those of the European population who are for any length of time resident in the country; namely, a redness or hyperæmia, which remains constant, and almost amounts to a staining of darkish red colour, over the *hypothenar palmar* surface of both hands. The condition was first brought to my notice by Mr. H. E. S. Cordeaux, C.B., who has had several years' residence in the country. No actual swelling or other symptoms seem to be related to this condition.

Poisons.—Except in one case, where a vegetable poison was taken by a native as a purgative, which caused death, with symptoms of acute gastric and renal irritation, no cases have occurred except bites or stings of insects.

General Sanitary Condition of the Protectorate.—Probably few other countries have so great a natural protection for the preservation of the public health as exist here. The dry heat and lack of thick vegetation, with the fierce sand storms which sweep the country, dry and cover up any animal or vegetable refuse very much in the same way as occurs in the desert proper. Drainage as such practically does not exist, nor in the ordinary sense is it necessary where the dry earth system exists naturally in so high a degree of perfection.

As regards water supply, only one town, that is, Berbera, can be said to have a moderately good supply service. The water comes from springs at a temperature on leaving the rock of about 100° F., and contains an excess of chlorides, but it is not unwholesome after standing for twenty-four hours to cool and deposit its sediment.

The other towns of Bulhar and Zeyla are supplied from very indifferent brackish wells, mostly situated at a distance from the actual vicinity of the dwellings.

Inland, water of a very fair quality is obtainable in small qualities.

Overcrowding.—This does not exist, as the population is a nomadic one, travelling over its tribal area and living under mat or grass shelters only.

Vaccinations.—The number of vaccinations performed during the year was 1,650; of these, 496 were successful, while in the case of 804 the result was unknown, leaving 350 as unsuccessful in result. It is probable that at the present time about 20 per cent. of the population has been vaccinated; about 5 per cent. of the tribes in the more immediate vicinity to our stations, and with whom we come more directly in contact, have the marks of small-pox.

General Observations.—An attempt has been made to give such demonstrations and instruction in General Hygiene as has come within the scope of interest of the more highly educated native teachers and other residents. Native masons, carpenters and artisans have been approached on matters dealing

more especially with their respective work, in its relationship to the public health.

Ventilation and such like matters in regard to stone-built houses, and the dangers associated with faulty drainage and water contamination have been fully dealt with.

There can be no question as to the fact that phthisis does occur in the country, and I am of opinion that this disease is slowly extending. An isolation hospital is in course of being built expressly for these cases, in the neighbourhood of Berbera.

At the present time a collection is being made of the stinging flies throughout the area accessible to Europeans; this it is hoped may prove a practically complete one when forwarded to the British Museum, for whom the collection is being made.

There have been no cases recorded of any disease deserving special mention, or report.

Colonial Medical Reports.—No. 23.—Gambia.

MEDICAL REPORT FOR THE YEAR 1905.

PATIENTS IN HOSPITAL.

	Remaining in Hospital Dec. 31st, 1904	Admitted during the Year	Died	Remaining in Hospital Dec. 31st, 1905
Europeans ..	Nil	17	2	Nil
Natives ..	16	436	27	18
Civil Force ..	1	45	2	2
Syrians ..	Nil	29	2	Nil
W. A. F. F. ..	7	79	1	4
Total ..	24	606	34	24

The deaths were due to the following diseases:—Beri-beri 1, blackwater fever 1, bronchial asthma 1, broncho-pneumonia 1, burn 1, acute gastritis 1, chronic pyæmia 1, chronic peritonitis 1, cardiac disease 2, chronic bronchitis 2, cerebral congestion 1, dysentery 1, debility 2, hospital gangrene 1, malignant fever with hyperpyrexia 1, meningitis 1, marasmus 1, phthisis 1, phagadoena 1, inanition 1, pneumonia 1, rheumatic fever 1, sleeping sickness 2, senile decay 2, starvation 2, tetanus 2, renal disease 1, acute bronchitis, 1.

The prevailing diseases were the following:—Intermittent fever, remittent fever, conjunctivitis, catarrh, dyspepsia, orchitis, œdema, whitlow, febricula, rheumatism, bronchitis, pneumonia, diarrhœa, abscess, ulcers, boils.

Of the rarer diseases met with there were guinea worm, syphillis, sleeping sickness, gout, leprosy, beri-beri, tetanus.

The following table shows the number of cases of illness and invalidings among Europeans during the past five years and the number resident in the colony for each year.

Europeans	1901	1902	1903	1904	1905
Number of Residents ..	88	98	105	100	114
Treated	89	26	47	42	43
Died	4	2	2	Nil	1
Invalided	3	2	2	Nil	1
Malarial Fever Cases ..	54	11	15	24	16
Blackwater Fever	..	..	..	..	6

The diseases suffered from were the following:—Biliousness, cellulitis, pleurisy, ulcer, febricula, and remittent fever.

Years	Total Deaths	Rate per 1,000	Deaths under 5 Years	Rate per 1,000
1901	340	38·63	137	15·56
1902	266	30·22	112	12·72
1903	315	35·79	130	14·77
1904	303	34·40	124	14·07
1905	299	33·95	117	13·29

The statistics of population for the year 1905 are:—Europeans 114, Africans 8,807; Increase 14 Europeans.

There has been no structural building or alteration during the year.

The European Staff remains the same.

The tank supply of water has been ample, although the two largest tanks are leaking.

Receipts.

Sale of Medicines and paying patients £82 7 1

Colonial Medical Reports.—No. 23.—Gambia *(continued).*

RETURN OF DISEASES AND DEATHS IN 1905, AT THE

Colonial Hospital, Infectious Hospital, and Gaol Infirmary.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	—	—	—
Anæmia	—	—	—
Anthrax	—	—	—
Beri-beri	1	1	1
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	—	—	—
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Congenital Malformation	—	—	—
Debility	8	2	9
Delirium Tremens	—	—	—
Dengue	—	—	—
Diabetes Mellitus	—	—	—
Diabetes Insipidus	—	—	—
Diphtheria	—	—	—
Dysentery	4	1	4
Enteric Fever	—	—	—
Erysipelas	—	—	—
Febricula	18	—	18
Filariasis	—	—	—
Gonorrhœa	2	—	2
Gout	1	—	1
Hydrophobia	—	—	—
Influenza	4	—	4
Kala-Azar	—	—	—
Leprosy	—	—	—
(*a*) Nodular	—	—	—
(*b*) Anæsthetic	—	—	—
(*c*) Mixed	—	—	—
Malarial Fever—	—	—	—
(*a*) Intermittent—	50	—	50
Quotidian	—	—	—
Tertian	—	—	—
Quartan	—	—	—
Irregular	3	2	3
Type undiagnosed	—	—	—
(*b*) Remittent	16	—	16
(*c*) Pernicious	—	—	—
(*d*) Malarial Cachexia	—	—	—
Malta Fever	—	—	—
Measles	—	—	—
Mumps	—	—	—
New Growths—	—	—	—
Non-malignant	—	—	—
Malignant	—	—	—
Old Age	2	2	2
Other Diseases	—	—	—
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	—	—	—
Rachitis	—	—	—
Rheumatic Fever	1	1	1
Rheumatism	15	—	15
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	—	—	—
Septicæmia	1	—	1
Sleeping Sickness	2	—	2
Sloughing Phagedæna	—	—	—
Small-pox	—	—	—
Syphilis—	2	—	2
(*a*) Primary	—	—	—
(*b*) Secondary	—	—	—
(*c*) Tertiary	—	—	—
(*d*) Congenital	—	—	—
Tetanus	4	2	4
Trypanosoma Fever	—	—	—
Tubercle—	—	—	—
(*a*) Phthisis Pulmonalis	—	—	—
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculous Disease of Bones	—	—	—
Other Tubercular Diseases	1	—	1
Varicella	—	—	—
Whooping Cough	—	—	—
Yaws	—	—	—
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	54	1	55
Circulatory System—			
(*a*) Valvular Disease of Heart	2	2	2
(*b*) Other Diseases	3	2	3
Digestive System—	—	—	—
(*a*) Diarrhœa	9	—	9
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	—	—	—
Congestion of Liver	—	—	—
(*d*) Abscess of Liver	—	—	—
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	—	—	—
(*g*) Cirrhosis of Liver	—	—	—
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	66	—	66
Ear	1	—	1
Eye	14	—	16
Generative System—	—	—	—
Male Organs	20	1	20
Female Organs	15	—	15
Lymphatic System	4	—	4
Nervous System	12	3	12
Nose	2	—	2
Organs of Locomotion	8	—	8
Respiratory System	62	7	70
Skin—	—	—	—
(*a*) Scabies	2	—	2
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	1	—	1
(*f*) Other Diseases	133	—	139
Urinary System	5	2	5
Injuries, General, Local—	42	1	46
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	—	—	—
Parasites—	6	—	6
Ascaris lumbricoides	1	—	1
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	2	—	3
Tape-worm	1	—	1
Poisons—			
Snake-bites	—	—	—
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	2	1	3
Surgical Operations—			
Amputations, Major	—	—	—
,, Minor	7	—	7
Other Operations	—	—	—
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

Expenditure.

Salaries and Allowance ...	2,427	0	9
Drugs and Maintenance ...	561	10	7
	£2,988	11	4

Among the 35 European officials there has been no serious illness.

The following diseases are recorded :—remittent fever 11, cellulitis 1, pleurisy 3, biliousness 1, febricula 3. Accidents : dislocated shoulder 1, injury to foot 1, strain 1.

Of the non-official Europeans one was invalided to Europe for persistent anæmia following fever.

Other cases were :—fever 16, anæmia 1, nephritis 1, catarrh 1, blackwater 3, biliousness 1, abscess 2 ; also some slight wounds.

There has been great improvement in the health of the prisoners in the Bathurst Goal. Only one case of beri-beri occurred, and this was undergoing punishment before the improvements were carried out (1903).

The prisoners are now more than ever employed outside the gaol, and also they are available for work on the new Victoria Recreation Ground (late McCarthy Square). This has had much to do with their good health.

The water supply is the same as before and has been ample.

Fortnightly meetings of the Board of Health took place regularly. Thirty labourers in the rains and twenty at other times are continually employed in sweeping and scavenging the town. Three carts and three horses are in constant use. These carts removed 4,780 loads of refuse, &c., also 311 loads of tins, bottles, &c.

There were 91 " Abatement of Nuisance " notices served, also 4,790 house-to-house visits, but no summonses nor convictions. Thirty labourers were employed.

Vaccinations were carried out regularly ; 987 vaccinated, of which 968 were successful. This is more than double the number of the preceding year, and ·01 unsuccessful only. Practically all were children or young adults. The same lymph as used the year before has proved very successful.

The efforts at vaccination in the Protectorate have been met with no response or appreciation by the natives.

The name of " McCarthy Square " is now altered to that of " Victoria Recreation Ground." During the rains of the year (1905) the square was enclosed with an iron railing. Gates were placed in the centre of each side. A macadam path near the railing is being carried round the Square and shrubs and plants in tubs are being planted. Eighteen garden seats (to hold four each) have also been provided ; also a lawn mower.

Jubilee Hospital Fund.

Dr. Total Receipts	£801	3	3
Cr. Total Expended	469	5	11
Balance Transferred to McCarthy Square Management Fund	331	17	4

Signed F. A. Baldwin,
Acting Senior Medical Officer,
February 28th, 1906.

In response to an official request Dr. Hopkinson states :—Although I am afraid that the above remark still holds good for the greater part of the Protectorate, there is at least one district (Kwinella and neighbourhood) where vaccination is really appreciated, and where genuine disappointment has been shown when I have visited that part without enough lymph to vaccinate all who apply. Again this year in the Upper River I found the same attitude. In other parts, however, hitherto my only vaccinations have been done when with His Excellency, his support and countenance having great weight with the people.

In response to an official request concerning the number of children vaccinated Dr. Hopkinson replied : —In 1905, 226 children were vaccinated by me in the Protectorate—in the McCarthy Island and Upper River Districts ; and 265 by Dr. Franklin in the South Bank and Kommbo. Total for 1905, 491. In 1906 I have vaccinated 85 at Willingharra and Kwinella. Total for 1905-6 up to date, 576.

In several places, notably Kwinella, Batelling and in Dembo Danso's District in the Upper River, I could have done at least twice as many vaccinations had lymph been available.

Colonial Medical Reports.—No. 24.—Southern Nigeria.

MEDICAL REPORT FOR THE YEAR 1905.

European Medical Staff.

The medical staff consists of 35 medical officers and 7 nursing sisters. During 1905 one medical officer was permanently invalided, another was murdered, and the Principal Medical Officer retired on a pension.

Health.

The health of the Europeans throughout the Protectorate has been fairly satisfactory.

European Population.

The average European population was 533, viz., 494 males and 39 females.

European Death-rate.

There were 12 deaths during the year, viz., 5 officials and 7 non-officials. In addition, 3 officials and 3 non-officials died a short time after their arrival in England of diseases contracted in the Protectorate. The death-rate calculated on those who died in the Protectorate is at the rate of 22·5 per thousand, or including the 6 that died in England, 33·7 per thousand.

When comparing the death-rate with that of England, it is well to note that there are no deaths in infancy or from old age.

Causes of Death.

Of the 12 deaths that occurred in the Protectorate, 7 were due to blackwater fever, 1 to malarial fever, 1 to cardiac failure in gastritis, 1 to apoplexy, 1 to accidental drowning, and 1 was murdered by the natives.

Invalidings.

Forty-three European officials and 45 non-officials were invalided.

Of the 43 officials 6 were permanently invalided out of the service, and another died within a short time of his arrival in England. Of the 88 invalided, 50 returned to Europe and 38 were sent for a sea trip. This gives an invaliding rate of 150 per thousand. Undoubtedly a high percentage, but probably the means of reducing the death-rate, which compares favourably with previous years.

Death-rate and Invalidings Compared with those of 1904.

In 1904 the average resident European population was 500, deaths 19 (including 2 in England), invalidings 42.

In 1905 the population was increased by 33, the deaths, including the 6 that died in England, are 1 less than in 1904, and the invalidings show an increase of 46 over those of 1904.

Prevalent Diseases.

Europeans suffered principally from malaria and disorders of the digestive system. The disorders of the digestive system were, as a rule, functional. A large percentage of Europeans suffered from some form of dyspepsia. This, in my opinion, is due to one of the following causes: (1) General deterioration in health; (2) bad cooking; (3) inappropriate foods. It frequently happens that a person when he first begins to suffer from dyspepsia considers it trivial and not necessary to consult a doctor about, and it is not till the complaint has become more or less chronic that he seeks the advice of a medical man.

Filarial Infection.

I regret to say I came across two fresh cases of filarial infection amongst the Europeans. These filariæ are about $\frac{1}{90}$th of an inch in length, and millions are, as a rule, present in the circulation. A large number of natives suffer from filariæ, and it is from them or from the infected European that the mosquito becomes infected, and he in his turn infects the European. All resident Europeans are now aware, I presume, of the mosquito theory of malaria, and a large number also know of the mosquito theory of filariæ, yet in spite of this you find Europeans who do not consider it necessary to use a mosquito curtain in districts where the mosquitoes though present are not sufficiently numerous to be troublesome. The question arises as to what is to be done with a European infected with filariæ. I am of opinion that he should not be allowed to remain in a place where there is a European reservation.

Quinine.

There appears to be a growing tendency amongst some European residents to underrate the value of quinine as a prophylactic against malaria. They become imbued with the idea that certain ailments, such as loss of memory, neuritis, dyspepsia, blackwater fever, are caused by its use. This idea is, to a certain extent, fostered by some medical men in England occasionally attributing a West African's ill-health to the taking of too much quinine.

After many years of experience, I am of opinion that the above-mentioned ailments are much more likely to be caused by malarial infection than by the use of quinine as a prophylactic, and those, particularly the more recent arrivals, who neglect to take quinine as a prophylactic because of its possibly causing loss of memory, &c., are not acting with justice to themselves or their employers.

Calabar (Europeans).

The health of Calabar as regards serious illnesses was good, though there was an increase in the number of those treated for slighter ailments. Many of the residents now realise the fact that a very narrow margin separates the slight fever from the malignant one, the former being as a rule a milder type of the latter, and they send at once for a medical man when they become ill, instead of waiting to see what will happen.

European Hospital.

I cannot speak too highly of the value of the European hospital to the residents, nor of the great assistance the nursing staff under Miss Graham is to the medical officers.

A patient who is at all seriously ill is attended day and night by one of the European sisters, and it is to that as much as anything else that I attribute our successful treatment of hospital patients. I strongly recommend such a system to those hospitals in West Africa where European nurses are not employed on night duty.

Cases Admitted to European Hospital.

One hundred and seventy cases were admitted during the year, with 2 deaths. Of the 2 deaths 1 died of blackwater fever, and the other had been brought from the Cross River suffering from malignant malaria. He was in a moribund condition on admission, and died within a few hours.

Calabar Gaol.

The health of the prisoners during the first six months of the year was bad, and the death-rate high. The majority of the deaths occurred amongst those who were old and decrepit. A type of dysentery, which, with few exceptions, was invariably fatal when it attacked those past middle age was responsible for a large number of the deaths. All known forms of treatment and the best possible nourishment appears to be of little or no use in these cases. The growing adult does well in prison, and as a rule puts on weight. The health of the prisoners during the second six months of the year was good.

Lunatic Asylum.

The asylum is at present only used for criminal lunatics. Accommodation is provided for the lunatics in three mud and wattle houses. Each house contains 4 rooms. In addition, there are 3 isolation wards made of cement blocks. I am of opinion that more permanent buildings than the present mud and wattle ones should be provided, and that a wall instead of the present wire fence should separate the males from the females.

St. Margaret's Native Hospital, Calabar.

There were remaining from 1904, 42 cases, and 767 were admitted, making a total of 809 intern patients treated. Thirty-nine deaths occurred amongst those treated. Twenty-two major operations were performed, with 3 deaths.

Major Operations Performed, 1905.

	No.	Result	
		Successful	Died
Amputation of Limbs	4	4	—
Excision of Breast	1	1	—
Excision of Tumours	3	3	—
Craniotomy	1	—	1
Elephantiasis	4	4	—
Radical Cure of Hernia	6	5	1
Hernia (Strangulated)	1	—	1
Hip-joint	1	1	—
Plastic	1	1	—
	22	19	3

The case of strangulated hernia was virtually moribund when operated upon. In addition to the above, I operated successfully on a European with *supra-hepatic abscess*.

The two Roman Catholic Sisters are doing good work at the native hospital. Their principal duty at present is to attend to female patients and to assist the medical officer in his gynæcological work.

Extern Patients.

Seven thousand six hundred and eighty-two extern patients were treated. I attach a table of cases treated.

Water Supply.

The water continues to maintain its high standard of quality, and is practically unlimited. I attach analysis of same. The water has been laid on to the various trading factories, and for the future they will be able to use this water instead of rain as heretofore.

Small-pox.

I am pleased to be able to report that no case of small-pox occurred in the Calabar district. A new contagious diseases hospital has been built, and will be open to patients next year.

Vaccination.

Twenty-four thousand and seventy-nine successful vaccinations are reported as having been performed throughout the Protectorate.

Meteorological Returns.

(All temperatures are recorded in degrees Fahrenheit.)

At Calabar the maximum shade temperature recorded was 92·71, and the minimum 70·67. The former was in February and the latter in August. The highest monthly mean temperature was 84·37 in March, and the lowest 77·15 in August. The mean temperature for the year being 81·21. The total rainfall was 167·39 inches. The mean degree of humidity, 84·29.

Bonny.

The maximum shade temperature was 96·21 recorded in February, and the minimum shade temperature 62·13, also in February. The highest mean monthly temperature was in March, viz., 81·66, and the lowest 76·63 in August. The mean temperature for the year was 79·58. The total rainfall was 167·75 inches. The mean degree of humidity, 83·78.

Sapele.

The maximum shade temperature was 90·32 recorded in February, and the minimum 70·42, also in February. The highest monthly mean temperature was 79·97 in March, and the lowest 75·15 in August; the mean temperature for the year being 77·86. The total rainfall was 116·25 inches. The mean degree of humidity, 84·55.

Asaba.

The maximum shade temperature was 96·19 recorded in March, and the minimum 67·83 in December. The highest mean monthly temperature was 80·88 in March, and the lowest, 75·79 in July. The mean temperature for the year was 77·89. The total rainfall, 59·42 inches. The mean degree of humidity, 81·88.

Bende.

The maximum shade temperature was 91·29 recorded in March, and the minimum 67·87 in December. The highest mean monthly temperature was 80·29 in March, and the lowest, 74·87 in August. The mean temperature for the year was 77·21. The total rainfall, 74·67 inches. The mean degree of humidity, 82·12.

Owerri.

Returns only made out from April to November. Rainfall, 92 inches. Maximum shade temperature, 91·57 in April. Minimum shade temperature, 71·25 in August.

Forcados.

Returns only made out from July to December. Rainfall, 87·81 inches. Mean degree of humidity, 86·44. Maximum shade temperature, 87·61, recorded in December. Minimum shade temperature, 72·48 in July.

Onithsa Plantation.

The maximum shade temperature was 92·83 recorded in April, and the minimum shade temperature 72·16 in January. The highest mean monthly temperature was 81·61 in March, and the lowest, 75·73 in July. The mean temperature for the year was 78·73. The total rainfall, 60·07 inches. The mean degree of humidity, 79·01.

Benin City.

No returns were furnished for March, April, and May. The maximum shade temperature was 88·71 recorded in February, and the minimum shade, 67·83 in December. The highest mean monthly temperature was 79·83 in June, and the lowest 74·71 in August. The mean recorded temperature for the year, 77·22. Recorded rainfall, 138·75 inches. Mean degree of humidity, 83·02.

Afikpo.

The maximum shade temperature was 91·70 recorded in April, and the minimum shade temperature, 69·22 in December. The mean monthly temperature was 82·69 in March, and the lowest, 76·87 in September. The mean temperature for the year was 79·00. The total rainfall, 83·88 inches. The mean degree of humidity, 82·66.

Calabar Town.

The sanitary condition is much improved. Roads and drains are being made throughout the town. Four latrines have been built, and are of great convenience to the natives. I think another four might with advantage be erected. The town is growing rapidly. I am of opinion that this growth is due to aliens from Lagos, Gold Coast, and Sierra Leone, rather than to the aborigines of the place.

The removal of the soldiers, with their wives and families, to the new barracks will be an important step towards European reservations. Owing to the large percentage of children that harbour the malarial parasites, they are undoubtedly a source of great danger to Europeans.

The sick returns throughout the Protectorate have heretofore not been made out in accordance with the "model return," so regret that, with the exception of Calabar, I am not in a position to furnish the model return for out-stations.

Bonny.

The health of both Europeans and natives was good. At present the medical officer has only one room in which to store his medicines, dispense and attend to patients. In the native hospital which is being built proper accommodation in the form of a consulting-room, dispensary and storeroom are provided. One of the stores at Tunnicliffe House has been fitted up as a prison. This store is well ventilated, and the floor has been raised, and as a lock-up is most suitable. Excluding the cases of beri-beri sent on from Calabar only four cases requiring to be isolated occurred in Bonny during last twelve months, two having been landed from a steamer. The health of the children at the Government school has been very good, and the water supply excellent.

European deaths, *nil*. Invalidings, *nil*.

Egwanga.

The health during 1905 was good. The native hospital is a very good type of native hospital. At one end there is a consulting-room, dispensary and storeroom, and at the other end quarters are provided for the native dispenser. The natives are now beginning to appreciate the advantages of such a hospital. The medical officer has done what he can to improve the sanitary condition of Opobo town, but owing to its low-lying situation and swampy condition little can be done in this direction. Much good work

has been done by carrying out the vaccination scheme, and small-pox, which was once very prevalent, is but seldom met with. The native town of Egwanga, which was a hotbed of disease, and was in close proximity to the European residences, has been cleared away.

Deaths amongst Europeans, *nil.* Invalidings, 7.

Degama.

All Europeans now live on the beach, and the hulk *George Shotton*, which was for a number of years used as a residence for European officials, has been done away with.

A native hospital, with consulting-room, store, and dispensary is being built. When completed this will be of great assistance to the medical officer, who up to now has had to put up with the most limited accommodation. The health of the prisoners has been fairly good. There was an outbreak of dysentery amongst them which caused several deaths. No cause for this outbreak could be found. The native town of Abonema still maintains its reputation of being one of the cleanest and best kept towns in the Protectorate. Vaccination is still largely carried on, with the result that a case of small-pox is but rarely met with.

Deaths amongst Europeans, *nil.* Invalidings, 8.

Brass.

The health of this station has been good. Though £400 had been allowed in the Estimates, 1905-1906, for a native hospital, it has not yet been built, though I am given to understand that building operations will shortly commence. Up to September the only accommodation the medical officer had, to see his patients in and dispense from, was a room 6 feet by 12 feet. In September Mr. James, who was acting as Deputy High Commissioner, handed over to the medical officer a native house to be used as a hospital and dispensary until such time as the native hospital was built. The health of the residents, both European and native, was good.

Deaths amongst Europeans, *nil.* Invalidings, 2.

Akassa.

The health amongst the Government officials, both European and native, was satisfactory. Two rooms are occupied by the medical officer in the Rest House, one of which he uses as a dispensary and the other as a storeroom. There is no accommodation for sick Europeans or natives. I think it would be advantageous if the dispensary and storeroom were placed on the ground floor, and two rooms were fitted up for sick Europeans. The drainage system between the Marine and Engineer's beach has been most successful, but I think some of the swamp in the immediate vicinity of Marine beach might, with advantage, be filled in.

There is a covered-in well between the Marine and Engineer's beach. I consider this type of well most suitable for out here.

Deaths amongst Europeans, 1. Invalidings, 9.

Onitsha.

This station is rapidly developing, and the headquarters of central division, which were originally at Asaba, have been transferred there. Within a short time Onitsha will have both a European and native hospital. Up to now the medical officer has been placed at a disadvantage in not having such hospitals. The drinking water is stored rain-water. I believe the Director of Public Works has under consideration a scheme for supplying water from a stream in the vicinity. I was able, in August, to station a second medical officer at Asaba and Onitsha. The exigencies of the services in January necessitated my leaving Asaba and Onitsha in charge of one medical officer. I hope to be able to send a second medical officer there shortly.

Deaths amongst Europeans, 3. Invalidings, 8.

Sapele.

The health of the Europeans at this station was good. A result, I have but little doubt, due to the Board of Health that exists here. I would strongly recommend the formation of similar boards at other stations.

With respect to the other stations throughout the Protectorate, I am pleased to report that the various medical officers are most energetic in trying to improve the health of the residents and sanitation of districts.

A. H. Hanley, C.M.G., F.R.C.S.I., &c.,
Acting Principal Medical Officer.

Comparative European Vital Statistics from 1901 to 1905.

Year	Number	Died	Invalided	Death-rate per mil.	Invaliding per mil.
Officials—					
1901	121	4	15	33	123·9
1902	125	3	31	24	248
1903	159	2	27	12·57	169·84
1904	157	7	18	44·58	114·64
1905	199	5	43	25·1	216
Non-officials—					
1901	276	13	32	47·1	115·9
1902	279	8	17	28·67	60·93
1903	301	10	27	33·22	89·70
1904	343	12	24	34·98	69·97
1905	334	7	45	20·9	134·7
Officials and Non-officials combined—					
1901	397	17	47	42·82	118·42
1902	404	11	48	27·22	118·81
1903	460	12	54	26·08	117·39
1904	500	19	42	38	84
1905	533	12	88	22·5	150

Note.—Three officials and three non-officials died in England in 1905, not included in above figures.

Admissions to European Hospital since 1901.

Year	Admissions	Died	Invalided
1901	118	2	13
1902	126	5	20
1903	128	2	13
1904	113	3	4
1905	170	2	4

Colonial Medical Reports.—No. 24.—Southern Nigeria *(continued).*

RETURN OF DISEASES AND DEATHS OF EUROPEANS IN 1901 THROUGHOUT THE

Protectorate of Southern Nigeria.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	4	—	4
Anæmia	62	—	62
Anthrax	—	—	—
Beri-beri	5	—	5
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	—	—	—
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Congenital Malformation	—	—	—
Debility	41	—	41
Delirium Tremens	—	—	—
Dengue	—	—	—
Diabetes Mellitus	—	—	—
Diabetes Insipidus	—	—	—
Diphtheria	—	—	—
Dysentery	17	—	17
Enteric Fever	3	—	3
Erysipelas	—	—	—
Febricula	—	—	—
Filariasis	—	—	—
Gonorrhœa	22	—	23
Gout	2	—	2
Hydrophobia	—	—	—
Influenza	1	—	1
Kala-Azar	—	—	—
Leprosy	—	—	—
(*a*) Nodular	—	—	—
(*b*) Anæsthetic	—	—	—
(*c*) Mixed	—	—	—
Malarial Fever—	458	2	458
(*a*) Intermittent—	14	4	14
Quotidian	—	—	—
Tertian	—	—	—
Quartan	—	—	—
Irregular	—	—	—
Type undiagnosed	11	—	11
(*b*) Remittent	—	—	—
(*c*) Pernicious	—	—	—
(*d*) Malarial Cachexia	—	—	—
Malta Fever	—	—	—
Measles	—	—	—
Mumps	—	—	—
New Growths—	63	—	63
Non-malignant	—	—	—
Malignant	—	—	—
Old Age	—	—	—
Other Diseases	136	—	136
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	—	—	—
Rachitis	—	—	—
Rheumatic Fever	—	—	—
Rheumatism	59	—	59
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	—	—	—
Septicæmia	—	—	—
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox	—	—	—
Syphilis—	4	—	4
(*a*) Primary	—	—	—
(*b*) Secondary	—	—	—
(*c*) Tertiary	—	—	—
(*d*) Congenital	—	—	—
Tetanus	—	—	—
Trypanosoma Fever	—	—	—
Tubercle—	—	—	—
(*a*) Phthisis Pulmonalis	—	—	—
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculous Disease of Bones	—	—	—
GENERAL DISEASES—*continued.*			
Other Tubercular Diseases	—	—	—
Varicella	—	—	—
Whooping Cough	—	—	—
Yaws	—	—	—
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	40	—	40
Circulatory System—	21	1	22
(*a*) Valvular Disease of Heart	—	—	—
(*b*) Other Diseases	4	—	4
Digestive System—	355	—	356
(*a*) Diarrhœa	—	—	—
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	—	—	—
Congestion of Liver	—	—	—
(*d*) Abscess of Liver	—	—	—
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	—	—	—
(*g*) Cirrhosis of Liver	—	—	—
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	—	—	—
Ear	24	—	25
Eye	15	—	15
Generative System—	—	—	—
Male Organs	—	—	—
Female Organs	—	—	—
Lymphatic System	40	—	40
Nervous System	43	—	43
Nose	2	—	2
Organs of Locomotion	2	—	2
Respiratory System	95	—	96
Skin—	179	—	179
(*a*) Scabies	—	—	—
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	—	—	—
(*f*) Other Diseases	—	—	—
Urinary System	41	—	41
Injuries, General, Local—	50	—	50
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	—	—	—
Parasites—	22	—	22
Ascaris lumbricoides	—	—	—
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	1	—	1
Tape-worm	—	—	—
Poisons—			
Snake-bites	—	—	—
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	1	—	1
Nature Unknown	—	—	—
Other Poisons	—	—	—
Surgical Operations—			
Amputations, Major	—	—	—
,, Minor	—	—	—
Other Operations	—	—	—
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

Return of Diseases and Deaths in 1901 at the

Native Hospital, Calabar, Southern Nigeria.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	2	—	2
Anæmia	1	—	1
Anthrax	—	—	—
Beri-beri	3	1	3
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	—	—	—
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Congenital Malformation	—	—	—
Debility	259	—	259
Delirium Tremens	—	—	—
Dengue	—	—	—
Diabetes Mellitus	—	—	—
Diabetes Insipidus	—	—	—
Diphtheria	—	—	—
Dysentery	40	6	40
Enteric Fever	—	—	—
Erysipelas	1	1	1
Febricula	—	—	—
Filariasis	—	—	—
Gonorrhœa	100	—	100
Gout	—	—	—
Hydrophobia	—	—	—
Influenza	1	—	1
Kala-Azar	—	—	—
Leprosy	—	—	—
(*a*) Nodular	—	—	—
(*b*) Anæsthetic	2	—	2
(*c*) Mixed	—	—	—
Malarial Fever—	—	—	—
(*a*) Intermittent	—	—	—
Quotidian	251	—	252
Tertian	—	—	—
Quartan	—	—	—
Irregular	—	—	—
Type undiagnosed	79	1	79
(*b*) Remittent	26	1	27
(*c*) Pernicious	—	—	—
(*d*) Malarial Cachexia	—	—	—
Malta Fever	—	—	—
Measles	2	—	2
Mumps	—	—	—
New Growths—	—	—	—
Non-malignant	—	—	—
Malignant	—	—	—
Old Age	—	—	—
Other Diseases	77	2	77
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	1	1	1
Rachitis	—	—	—
Rheumatic Fever	1,178	—	1,184
Rheumatism	—	—	—
Rheumatoid Anthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	—	—	—
Septicæmia	—	—	—
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox	—	—	—
Syphilis	—	—	—
(*a*) Primary	30	—	30
(*b*) Secondary	52	—	52
(*c*) Tertiary	—	—	—
(*d*) Congenital	—	—	—
Tetanus	—	—	—
Trypanosoma Fever	—	—	—
Tubercle—	1	—	2
(*a*) Phthisis Pulmonalis	—	—	—
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculosis Disease of Bones	—	—	—
Other Tubercular Diseases	—	—	—
Varicella	69	—	77
Whooping Cough	—	—	—
Yaws	9	—	9
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	980	1	992
Circulatory System—	27	2	27
(*a*) Valvular Disease of Heart	—	—	—
(*b*) Other Diseases	—	—	—
Digestive System—	1,729	10	1,729
(*a*) Diarrhœa	—	—	—
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	—	—	—
Congestion of the Liver	—	—	—
(*d*) Abscess of Liver	—	—	—
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	—	—	—
(*g*) Cirrhosis of Liver	—	—	—
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	—	—	—
Ear	69	—	69
Eye	173	—	173
Generative System—	—	—	—
Male Organs	72	—	76
Female Organs	13	1	14
Lymphatic System	38	—	38
Nervous System	201	2	202
Nose	—	—	—
Organs of Locomotion	192	—	192
Respiratory System	694	4	695
Skin—	356	—	357
(*a*) Scabies	—	—	—
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	—	—	—
(*f*) Other Diseases	—	—	—
Urinary System	25	—	27
Injuries, General, Local—	1,007	3	1,033
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	—	—	—
Parasites—	218	—	284
Ascaris lumbricoides	—	—	—
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	—	—	—
Tape-worm	—	—	—
Poisons—			
Snake-bites	—	—	—
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	1	—	1
Surgical Operations—			
Amputations, Major	22	3	22
,, Minor	360	—	360
Other Operations	—	—	—
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

NUMBER OF NATIVES TREATED AT NINETEEN OUTSTATIONS DURING 1905.

DISEASES.	Total Cases Treated.	Deaths.
Malarial Fever	1,175	1
Hæmoglobinuric Fever	1	—
Unclassified Fever	106	5
Enteric Fever	—	—
Variola	160	29
Varicella	21	1
Dysentery	425	58
Beri-beri	203	20
Erysipelas	—	—
Pyæmia	1	1
Yaws	91	—
Tetanus	1	—
Tubercle	20	2
Leprosy	15	1
Syphilis	106	—
Gonorrhœa	575	—
Rheumatism	1,878	1
Anæmia	52	—
Influenza	3	—
Gout	2	—
Meningitis	—	—
Epilepsy	3	—
Debility	42	11
Paralysis	2	—
Alcoholism	2	—
Diseases of Circulatory System	105	11
,, Cellular Tissue	265	—
,, Digestive System	3,869	53
,, Ear	244	—
,, Eye	407	—
,, Genito-Urinary System	297	8
,, Lymphatic System	308	1
,, Nervous System	213	2
,, Nose	9	—
,, Organs of Locomotion	111	—
,, Respiratory System	1,764	28
,, Connective Tissue	18	—
,, Skin	1,563	—
Injuries, General	10	1
,, Local	3,113	12
Poisons	28	1
Parasitic Diseases	392	—
Guinea-worms	148	—
Ascaris Lumbricoides	5	—
Filarial Loa	3	—
Local Diseases	77	10
Measles	4	—
Other Diseases	360	3
Appendicitis	1	1
Insanity	2	1
Sleeping Sickness	1	1
Ulcers and Abscesses	2,378	6

APPENDIX A.

REPORT ON LEPER ASYLUM, ASABA.

The Leper Asylum is a collection of reed huts in which live, on an average, 29 lepers, 13 male and 16 female.

These people, on the whole, seem to lead a happy existence, they are well fed and cared for; they are not enclosed and are practically free to wander where they like.

The admissions during the year numbered seven; a considerable number of lepers demanded admission, which in most cases was refused, owing to lack of funds for their support. Three children were born in the asylum, all of whom died within a short period; four lepers died and three left of their own accord.

In these cases I did not try to prevent their departure whenever satisfied that they were able to support themselves, as, apart from the absence of means of compulsion, I consider the limited accommodation of the settlement could be turned to the best account by being reserved for refugees and prisoners.

The staff consists of one native overseer, who has discharged his duties exceptionally well, and who is extremely gentle to the patients. It appears that the staff is undermanned, and that it is impossible to prevent patients wandering through the markets when they feel inclined during the absence of the overseer.

It is intended that the asylum be removed to Onitsha side in the near future, and, therefore, I do not think it worth while to suggest improvements in the Asaba settlement.

I do not know whether it is the intention of the Government to enforce isolation in cases of leprosy, if so it will be necessary to provide accommodation for at least 1,000 lepers from this district alone, and a scheme which does not embrace all cases is useless. I suggest as the only way of carrying out isolation on a large scale that the villages be required to provide settlements for their lepers, each to be supervised by an overseer appointed by the Government, who, with the headmen, will be responsible that lepers do not wander into the compounds of the healthy; this plan could be tried without expense in one or two of the native court towns and extended if found workable; the settlement at Onitsha could then be reserved for criminals and refugees, of whom there will be a sufficient number to tax its accommodation.

E. MOORE,
District Medical Officer.

Colonial Medical Reports.—No. 25.—Northern Nigeria.

MEDICAL REPORT FOR THE YEAR 1905.

By Dr. S. W. THOMPSTONE.

Principal Medical Officer.

THE average number of Europeans resident in the Protectorate during the year was 342, of whom 277 were officials and 65 non-officials—331 being males and 11 females.

The native population was estimated as being 9,000,000 approximately.

Ten Europeans died during the year, 7 of whom were officials and 3 non-officials.

The total crude European death-rate for the year, calculated on the average resident population, was 29·23 per 1,000. As in former years, there was a very marked difference in the mortality rate of officials and that of other members of the community, there having been 7 deaths among 277 officials and 3 amongst 65 non-officials, giving an official death-rate of 25·27 per 1,000 as against a non-official one of 46·15 per 1,000. The difference is, however, much less marked this year than last, when the rates were 29·62 and 96·15 respectively.

These death-rates are, as stated above, "crude" death-rates, and they are not corrected for age and sex distribution, and are therefore not comparable with that of communities consisting of persons of all ages and both sexes in the proportions met with in Europe.

There has been an increase in the average resident European population as compared with 1904 of 20, last year's population having been estimated at 322. The death-rate has decreased by 11·14 per 1,000, and the invaliding rate by 64·73 per 1,000, the latter rate being 143·27 for the year 1905, as against 208 per 1,000 for 1904.

As in former years, the rainy season has proved the most unhealthy for Europeans, the greatest amount of sickness having occurred during the months of July, August and September. The wettest month, August, was the worst month, and March showed the fewest admissions—the former month having the highest relative humidity and the latter being the driest in the year.

The general character of the diseases prevailing showed little or no change. The case mortality of hæmoglobinuric fever was slightly higher than in 1904, but much lower than in 1903. The figures for the three years being 37·3 per cent. in 1903, 16·1 per cent. in 1904, and 20 per cent. in 1905; the actual number of admissions from this disease being 20, and the number of deaths 4, as against 31 cases with 5 deaths last year.

During the first three months of the year a very severe epidemic of cerebro-spinal fever broke out in all the provinces of the Protectorate—Borgu, Kontagora, Sokoto, and Bornu being the only places that escaped. With the exception of an outbreak among the East African carriers at Cape Coast Castle during the Ashanti Expedition of 1900, this is the first recorded epidemic of this disease in West Africa, though A. Plehn mentions it as being amongst the diseases met with in Kamorun.

From enquiries made among the older natives it would seem that epidemics of this disease occur periodically over the whole of Northern Nigeria, and have been usually even more severe. The tradition is that it came originally from the north-east, but not in the memory of living man. Fifty years ago an epidemic is said to have occurred at Egga on the Niger, and ten years ago Kano was decimated by a very severe outbreak.

It is impossible to estimate the actual number of deaths, but there were certainly over 100 in Bautchi, 250 in Ilorin, and 60 in Zungeru, during the month of February alone, and the natives say that here were 50 deaths a day in Zaria, and 100 a day in Kano during January. Dr. McGahey reported from the Yola district that some of the villages lost 5 per cent. of the population during the three months, that in Yola town itself there were 300 deaths from the disease, and that the case mortality was approximately 50 per cent.

All native accounts agree in its being essentially a dry season disease, which always disappears when the rain begins. January, February and March being the bad months, the dust-storms being probably the cause of its spread, by disseminating the dread nasal secretions containing the causal organisms far and wide. At the commencement of the epidemic the case mortality was appalling—many of those attacked practically falling dead at their work—later, however, its virulence became attenuated and many of the later cases recovered.

Only two Europeans were attacked, both of whom died—one in Kano and one between Zaria and Zungeru; this comparative immunity being almost certainly due to the principle which has been adopted when laying out new stations, of building the European quarters at a distance from the native towns.

Several epidemics of small-pox also occurred during the dry season, but none of any great magnitude. The town of Katagum and an adjacent village called Kudabir suffered somewhat severely, and in the town of Bautchi the Emir stated that there had been 100 deaths during January and February from small-pox. In the Bautchi district it would appear that the disease spread from Kassina, a hamlet south of Zoranda, and from there was carried to Bautchi, and thence spread into the surrounding districts. The village of Keffin Fulani, between Bautchi and Ningwe, was practically emptied owing to the ravages of the disease. With the exception of a soldier and a horse-boy, no cases occurred in the camp.

Colonial Medical Reports.—No. 25.—Northern Nigeria (*continued*).

An interesting fact reported by the medical officer at Bautchi is that the *cow fulani* almost invariably escape small-pox: they are said to practise a form of inoculation of cow-pox virus, having apparently discovered for themselves that the one disease renders them immune from the other. Amongst other natives inoculation with small-pox virus is common—the sufferer being paid a small sum to allow the procedure.

There was practically no difference in the relative mortality amongst the Europeans in the different seasons. There were, however, many more native deaths during the first three months of the year—the increased mortality being principally due to the epidemics of cerebro-spinal fever and small-pox which broke out during the period.

Zungeru.—The rainfall during the year was 41·31 inches, or 9·8 inches less than in 1904; the wettest month being September with 8·04 inches. Rain fell during eight months of the year—March to October inclusive—the heaviest fall recorded being 2·63 inches in the twenty-four hours, on October 15th.

The maximum shade temperature was 106° F., which was recorded on April 8th; the minimum, 56° F., on December 1st. The highest mean temperature for the month was 87° F. in March and April, and the lowest 77·3° F. in August; the mean temperature for the year being 80·1° F. The mean relative humidity for the year was 58, the highest mean being 81·6 for August, and the lowest 33 for January and February—calculated from readings taken at 9 a.m. The lowest actual relative humidity recorded was 16, from hygrometer readings taken at 4 p.m. on April 7th, and December 21st and 30th.

Lokoja.—The total rainfall was 49·64 inches for the year, or 7·92 inches more than last year—the heaviest rainfall occurred in September, 16·28 inches. The maximum shade temperature was 101° F., which was recorded on March 10th, and the minimum 53° F., on December 31st. The highest mean temperature for the month was 87° F. for March and April, and the lowest 78° F. for August and December—the mean temperature for the year being 81° F.

The mean relative humidity for the year was 72, the highest mean being 78·7 for September, and the lowest 60 for March.

The highest temperature recorded in Northern Nigeria during the year was 118° F. at Maifani on April 8th, and the lowest 39° F. at Kano on February 2nd: the highest mean temperature for the year being at Kontagora, 82° F., and the lowest, Zaria, 74° F. The greatest rainfall was at Zaria with 51·27 inches, and the lowest, Sokoto, with 33·32 inches. The maximum fall on one day being at Ilorin, on June 2nd, 4·04 inches.

The general direction of the wind throughout the Protectorate was from the south-west from June to November, and from the north-east during the remaining months of the year, the Harmattan lasting, with slight intermissions, from December to the end of May; the first tornado occurring in March, and the rainy season ending in October.

The meteorological conditions have considerable influence on the health of the community, the dry season being comparatively more favourable to Europeans, owing to the absence of mosquitoes and the more bracing condition of the atmosphere—the nights being cool, and the temperature, though high during the day, owing to the low relative humidity, being much more easily borne than the damp relaxing heat of the rains. The number of admissions from malaria rise rapidly after the first tornadoes, and reach their maximum when the rains are heaviest. The natives, on the contrary, suffer more during the dry season, not only from epidemics, but from respiratory and digestive diseases brought on by the cold nights and scarce and impure water supply.

The greatest amount of sickness during the year among Europeans has been due to malaria. The total number of admissions from this disease (excluding blackwater fever for the sake of convenience) having been 445 with no deaths, compared with 515 admissions with 3 deaths last year.

Twenty cases of hæmoglobinuric fever occurred, with 4 deaths, and 34 of dysentery with no deaths. There were 2 cases of small-pox in Europeans during the year. Among the natives treated there were 1,090 cases of malaria with 12 deaths, 451 cases of dysentery with 48 deaths, and 769 cases of rheumatism with 1 death. Complete lists of all diseases treated both among Europeans and natives are attached at the end of this report.

The general sanitary condition of the European stations is good—the great need being better quarters. The expense of transport of material is so great that in practically all the stations off the rivers officers have to live in mud or grass native-built houses, which harbour insect life and are anything but weatherproof.

The water supplies have been improved where possible, the small condensers supplied to outstations having proved a great success. They have in conjunction with other sanitary measures been the cause of a large reduction in the number of cases of dysentery met with, no death having occurred from this disease during the last two years.

Under the influence of European teaching the large native towns are beginning to show some signs of improvement, but it will be many years before much can be done in this direction.

Zungeru.—The average resident European population during the year was 66—61·6 officials and 4·4 non-officials. The sanitary condition of the cantonment is excellent, the drainage being effective and the water supply good. The series of dams which was constructed last year for the purpose of holding up the water in the Dago and providing for a continuous flow, has answered its purpose admirably, and has now stood the test of two dry seasons.

The drinking water supplied by the condenser is of good quality and sufficient for all requirements.

The general health of the population has been good. The number of admissions to hospital was 92 with 2 deaths, one of which was the case of a patient who was brought into hospital from Barajuko, and whose illness was contracted on the river. Last year there were 123 admissions with 4 deaths—a very marked reduction both in the number of admissions and the case mortality.

Gaol.—The sanitary condition is good, the cells

being kept clean, and the yard dry and well swept. The ventilation works out at about 350 cubic feet per inmate, and as the doors are grated and ample openings are provided in the walls the air in the buildings is always fresh. The water supply is obtained from the Kaduna and Dago Rivers, and is of good quality and ample in amount, no limit being laid down as to the quantity supplied. Combustible refuse is burnt, and excreta carried out in pans and buried in trenches.

The general health of the prisoners during the year has been fair, but many of the inmates were in wretched condition when admitted. The principal diseases which occurred were dysentery, diarrhœa, rheumatism, guinea-worm and pneumonia.

The average number of prisoners was 162; and the quality of the prison diet good.

Freed Slaves' Home.—Both the compound and the buildings are kept clean and in excellent sanitary condition. The average number of inmates during the year was 167, and their general health was good.

Ventilation is free and sufficient, and the water supply, which is obtained from the Kaduna and Dago, is good and ample. All drinking water is boiled before use. The refuse is disposed of by burning and burying in trenches—the pan system for excreta being in use.

The prevalent diseases were stomatitis, diarrhœa, intestinal parasites, and dysentery.

Lokoja.—The average resident European population was 73·8, 60 being officials and 13·8 non-officials. The sanitary condition of the cantonment is very good, great improvement having being effected during the past year. The drainage is satisfactory, and the European compounds and native lines well kept and clean. The drinking water from the condenser has been of excellent quality and sufficient in amount.

The general health of the community has been much better than in any previous year—the admissions to hospital having been only 101, as against 145 in 1904.

Gaol.—The sanitary condition of the gaol is extremely good, and the general health of the prisoners satisfactory. The water supply is obtained from a stream which runs near the prison, and from rain-water tanks on the premises. The supply is ample and the quality good. Ventilation is free and sufficient.

The average number of prisoners during the year was 67; and the prevalent diseases were diarrhœa and malaria.

Kano.—The average resident European population during the year was 21·8. The sanitary condition of the station is as good as circumstances will allow, but drainage is unsatisfactory, as owing to the nature of the ground no proper fall is obtainable at Nassarawa. A new site at Goza has been occupied by the military during the year with a view of testing its suitability for a permanent cantonment, and the results of the year's experience are being submitted separately.

The general health has been unsatisfactory, but so far as can be gathered from the statistics at present to hand, the new site presents distinct advantages over that now occupied by the civil population.

The water supply is derived from wells at Nassarawa, which have proved insufficient for the needs of a large population during the dry season. At Goza it is obtained from pools fed by springs, and has so far proved sufficient.

There were 1,398 successful vaccinations performed during the year, all stations being now supplied with small consignments of lymph by each mail. The greatest difficulty is still experienced in obtaining it in an active condition at those stations which are farthest away from the sea-coast—the results for the year at Sokoto and Katagum being *nil*. In spite of this difficulty considerable progress has been made towards protecting the native troops and the inhabitants of the towns nearer headquarters.

Small-pox is endemic—a very considerable proportion of the adult population showing marks of previous attacks, and those who have not suffered from the disease are becoming keenly alive to the protection afforded by vaccination, being most anxious to have the operation performed whenever an outbreak occurs. To overcome the difficulty of obtaining active lymph the experiment of forming small vaccine stations at two or three stations intermediate in distance from the sea, such as Zaria, Kontagora, and Koffi, would be well worth trying. If these prove a success the system could then be extended with some hope of protecting the population in those portions of the Protectorate in which it has up to now proved impossible to obtain successful results.

Two cases of small-pox have occurred among the European officials, both of which, however, recovered.

The general health of the European community has been better than in any year on record. Both the death-rate and invaliding rate have been much lower than last year, the death-rate, which was 29·23 per 1,000, having been 20·33 per 1,000 less than the average of the previous five years, which works out at 49·56 per 1,000.

STATISTICS OF EUROPEAN POPULATION.

Europeans	1900	1901	1902	1903	1904	1905
Average actually in the Protectorate	165	165	290	309	322	342
Number of Deaths ..	13	9	9	18	13	10
Number of Invalids..	21	30	20	43	67	49

ANALYSIS OF 1905 STATISTICS.

Europeans	Total	Deaths	Death-rate per 1,000	Invalids	Invaliding Rate per 1,000
Average actually in the Protectorate	342	10	29·23	49	143·27
Officials	277	7	25·27	39	140·79
Non-officials	65	3	46·15	10	153·84

The invaliding rate was 143·27 per 1,000, the average for the last five years being 144·6.

The health of the native population was very bad during the earlier months of the year, owing to the epidemics of cerebro-spinal fever and small-pox above referred to. The total number of natives treated at

RETURN OF DISEASES AND DEATHS OF EUROPEANS IN 1905 THROUGHOUT THE

Protectorate of Northern Nigeria.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	1	—	1
Anæmia	29	—	29
Anthrax	—	—	—
Beri-beri	—	—	—
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	—	—	—
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Congenital Malformation	—	—	—
Debility	45	—	45
Delirium Tremens	—	—	—
Dengue	—	—	—
Diabetes Mellitus	—	—	—
Diabetes Insipidus	—	—	—
Diphtheria	—	—	—
Dysentery	34	—	35
Enteric Fever	2	2	2
Erysipelas	—	—	—
Febricula	—	—	—
Filariasis	—	—	—
Gonorrhœa	—	—	—
Gout	—	—	—
Hydrophobia	—	—	—
Influenza	—	—	—
Kala-Azar	—	—	—
Leprosy	—	—	—
(*a*) Nodular	—	—	—
(*b*) Anæsthetic	—	—	—
(*c*) Mixed	—	—	—
Malarial Fever—	445	—	448
(*a*) Intermittent—	—	—	—
Quotidian	—	—	—
Tertian	—	—	—
Quartan	—	—	—
Irregular	—	—	—
Type undiagnosed	10	—	11
(*b*) Remittent	—	—	—
(*c*) Pernicious	20	4	23
(*d*) Malarial Cachexia	—	—	—
Malta Fever	—	—	—
Measles	—	—	—
Mumps	—	—	—
New Growths—	—	—	—
Non-malignant	—	—	—
Malignant	—	—	—
Old Age	—	—	—
Other Diseases	—	—	—
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	—	—	—
Rachitis	—	—	—
Rheumatic Fever	—	—	—
Rheumatism	37	—	37
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	—	—	—
Septicæmia	—	—	—
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox	2	—	3
Syphilis—	—	—	—
(*a*) Primary	—	—	—
(*b*) Secondary	—	—	—
(*c*) Tertiary	—	—	—
(*d*) Congenital	—	—	—
Tetanus	—	—	—
Trypanosoma Fever	—	—	—
Tubercle—	—	—	—
(*a*) Phthisis Pulmonalis	—	—	—
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculous Disease of Bones	—	—	—
Other Tubercular Diseases	—	—	—
Varicella	—	—	—
Whooping Cough	—	—	—
Yaws	—	—	—
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	12	—	12
Circulatory System—	—	—	—
(*a*) Valvular Disease of Heart	1	—	1
(*b*) Other Diseases	4	1	4
Digestive System—	109	—	109
(*a*) Diarrhœa	20	—	20
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	—	—	—
Congestion of Liver	—	—	—
(*d*) Abscess of Liver	6	—	6
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	2	—	2
(*g*) Cirrhosis of Liver	—	—	—
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	16	—	16
Ear	4	—	4
Eye	14	—	15
Generative System—	13	—	14
Male Organs	—	—	—
Female Organs	—	—	—
Lymphatic System	15	—	15
Nervous System	10	—	10
Nose	1	—	1
Organs of Locomotion	3	—	3
Respiratory System	21	—	21
Skin—	—	—	—
(*a*) Scabies	—	—	—
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	6	—	6
(*f*) Other Diseases	40	—	40
Urinary System	—	—	—
Injuries, General, Local—	46	—	49
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	6	—	6
(*c*) Other Injuries	14	—	14
Parasites—	6	—	6
Ascaris lumbricoides	—	—	—
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	—	—	—
Tape-worm	—	—	—
Poisons—			
Snake-bites	—	—	—
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	4	—	4
Surgical Operations—			
Amputations, Major	—	—	—
,, Minor	—	—	—
Other Operations	—	—	—
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

the government hospitals and dispensaries during the year was 16,557, an increase of 3,052 over last year. Of these, 1,090 were cases of malarial fever.

Dispensaries have been established during the year in most of the provinces, and although they have necessarily been equipped on a very small scale, 2,531 paupers have been treated throughout the Protectorate during the year.

The permanent enclosures to which I referred in my report last year, which were erected at Lokoja and Zungeru for isolating cases of infectious disease, have been invaluable, grass huts being run up inside them for the accommodation of patients, and burnt when the epidemic subsides. In former years it was found to be practically impossible to prevent the friends of the patients visiting them at night and spreading the disease abroad. This has now been effectually stopped and effective isolation provided.

Venereal diseases are still very prevalent, there having been 1,063 cases of gonorrhœa and 370 of syphilis treated among natives during the year. The further away a station is from the sea the more cases of syphilis are met with, Bornu having the greatest number in Northern Nigeria; scarcity of water and consequent lack of personal cleanliness probably explaining the fact in part.

Colonial Medical Reports.—No. 26.—Saint Lucia.

ANNUAL REPORTS ON THE HOSPITALS AND DISPENSARIES, 1904.

CASTRIES.

Alex. King, M.B., Ch.B., D.P.H., 2nd District Medical Officer for Castries.

In Castries better means of sewage collection and disposal should be adopted. The bucket system can hardly be dispensed with, but could easily be carried out on better lines, as it is capable of great improvement.

Bye-laws as to the disposal of domestic waste water should be enforced. The habit is to throw it on the ground in the most convenient place, thus producing a very foul state of the subsoil. This is especially objectionable as wells still exist, though apparently they are little used. The large prevalence of intestinal parasites is traceable to the same careless habit of throwing down filth around the houses.

There is a good deal of overcrowding both of persons in houses and of houses on the land. As things stand at present the space round each house is hopelessly deficient, resulting in the crowding together of outhouses which should be widely separate; for instance, privies are found next to and communicating with kitchens and servants' quarters, and cowhouses in the same relation to bakehouses.

It is an accepted fact that the death-rate varies directly with the density of the population, and though the Castries death-rate is wonderfully small it could be further reduced. At the same time this death-rate is not, I think, a very true index of the town's freedom from disease. In the present constitution of the population, owing to industrial conditions, there is an excess of young adults, and a population so constituted has naturally a small death-rate.

Although the town has a good supply of gravitation water, tanks still abound. They are very well as a stand by, but should be built so as to be easily inspected; should be covered so as to prevent access of mosquitoes, and should be cleansed at regular intervals. Until these provisions are carried out tanks should be looked on with suspicion, if not actually as a nuisance.

The rivers round the town are in general use for washing clothes and are not suitable for the purpose. The flow of water is small at best, and now the beds are fouled with soapsuds, &c. The woman who washes furthest upstream may get clean water; those below certainly do not. Disease might easily be spread in this way.

Anse-la-Raye village requires a better water supply. The plots round the houses are not well kept, and there are heaps of rubbish all through the village. The wash of the surf has piled up the sand till one of the beach privies has been left high and dry. The villagers continue to use it, so now there is a large collection of filth which is apparently never removed or even covered. The whole system of beach privies is objectionable, but when accidents of this kind happen it becomes injurious.

The ditch which runs parallel to the back of the village is stagnant, forming a splendid breeding-ground for mosquitoes. It also smells foul.

The village round Roseau Factory is dirty and badly kept.

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ANSE-LA-RAYE DISPENSARY.

THE diseases treated at Anse-la-Raye Dispensary for the year 1904 were as follows:—

Intestinal Parasites	134
Malaria	57
Diseases of Digestive System	46
,, Respiratory ,,	24
,, Nervous ,,	7
,, Circulatory ,,	5
,, Urinary ,,	1
,, Ear	2
,, Eye	7
,, Throat	3
,, Nose	2
,, Male Organs	1
,, Female ,,	12
,, Blood	6
,, Skin	8
Syphilis	11
Ulcers, Abscesses, &c.	13
Injuries	6
Tuberculosis	1
Hernia	2
Rachitis	1
Rheumatism	9
Arthritis	1
Spina bifida	1
Teeth Extracted	4
Indefinite	20
Total	384

GROS-ISLET DISPENSARY.

Alex. King.

The number of patients attending was 554. The following is an analysis:—

Diseases of Digestive System	75
,, Respiratory ,,	39
,, Circulatory ,,	29
,, Urinary ,,	1
,, Nervous ,,	11
,, Lymphatic	4
,, Eye	4
,, Ear	10
,, Throat	2
,, Skin	19
,, Male Organs	1
,, Female ,,	18
,, Blood	1
Malignant New Growth	1
Rheumatism	11
Hernia	1
Tuberculosis	2
Malaria	121
Intestinal Parasites	88
Influenza	3
Ulcers, Abscesses, &c.	7
Injuries	3
Pregnant	4
Senility	3
Indefinite	21
Returns	75
Total	554

The most remarkable feature is the total absence from the list of syphilis and gonorrhœa. Next is the extremely low percentage (3 per cent.) of tuberculosis. Following on the absence of venereal disease the percentage of cases of disease of male organs is very small.

Malaria increased enormously in the last two months of the year. The others are fairly evenly distributed.

DENNERY.

Edwin Wells, M.B.(Edin.).

At the end of July, Dr. Payne resigned charge of this district and I took over from him on August 1st.

The number of persons who consulted me in both Micoud and Dennery Dispensaries during the year was 1,470. Malarial fevers, worms and digestive disturbances claim the lion's share of attention.

Malarial fevers are prevalent in the autumn, though cases are seen here and there all the year round.

In August and September an epidemic of whooping-cough invaded the district, but was quickly got under control and stamped out.

The estimated population for the year 1904 was 4,500. There were 91 deaths during the year, giving a death-rate of 20·2 per 1,000. One hundred and sixty-seven births took place in the district, the rate being 37·1 per 1,000.

SANITATION.

The sanitary condition has been fairly good all round. No diseases could be traced directly to insanitary conditions.

The sanitary condition of Micoud has been very good, and it is one of the cleanest villages in the island.

I append a list of the diseases treated at the Dennery and Micoud Dispensaries and the annual return for the hospital.

List of diseases treated at Dennery Dispensary during 1904:—

Alimentary System	96
Hæmopoietic ,,	17
Respiratory ,,	99
Genito-urinary ,,	54
Special Senses	36
Malarial Fevers	190
Worms	202
Anæmia and Debility	29
Ulcers	16
Teeth Extraction	32
Suppuration and Abscess	6
Ankylostomiasis	6
Skin	31
Hysteria	8
Pregnant	3
Nervous	34
Senility	5
Rheumatism and Lumbago	15
Elephantiasis (Filaria)	1
Deformity	1
Bones and Joints	12
Hernia	1
Leprosy	1
Fracture	1
No Disease	28
Total	924

List of diseases treated at Micoud Dispensary during 1904 :—

Alimentary System	47
Hæmopoietic ,, ...	4
Respiratory ,, ...	61
Genito-urinary ,, ...	11
Special Senses	19
Malarial Fevers	31
Worms	176
Anæmia and Debility	11
Ulcers	27
Teeth Extraction	14
Suppuration and Abscess	11
Ankylostomiasis	12
Skin	19
Pregnant	7
Nervous	5
Senility	12
Rheumatism and Lumbago	31
Elephantiasis	3
Deformities	5
Bones and Joints	17
Hernia	3
Bursitis	4
No Disease	15
Total	546

DENNERY HOSPITAL. RETURN OF ADMISSIONS, DISCHARGES, AND DEATHS DURING THE YEAR 1904.

	Natives			Foreigners			Coolies				
	Males	Females	Total	Males	Females	Total	Males	Females	Total		
Number in Hospital at last Return	1	2	3	1	..	1	3	..	3	7	221
Admitted during year	50	37	87	30	10	40	57	30	87	214	
Total	51	39	90	31	10	41	60	30	90	221	
Discharged cured	33	25	58	25	6	31	49	21	70	159	209
Discharged uncured	12	8	20	5	1	6	7	2	9	35	
Deaths	1	2	3	1	2	3	2	7	9	15	
Total	46	35	81	31	9	42	58	30	88	209	
Remaining in Hospital at the close of the year	4	5	9	..	..	..	3	..	3	12	

SOUFRIÈRE.

J. A. Lestrade, M.B., C.M., District Medical Officer, Soufrière.

The health of the Second District was good. Beyond ordinary ailments there were very few noticeable diseases of a severe type among the people. I attribute this to the better scavenging now going on for some time, but principally to the new water supply given to the town. One sees very few cases now of those continued fevers and bowel complaints which raged formerly in the town during the hottest part of the summer and autumn season; though there were three mild epidemics of a contagious character during the year. Throughout the year, but principally about the time of the hot season, a skin disease, which was also prevalent the year before, was noticed. I believe this was caused by the irritation of minute particles of dust present in the atmosphere whenever the volcano of "Mont Pélée" at Martinique erupted, as it was first noticed after the first eruption in 1902.

About August, and for some time after, influenza was mildly prevalent, but it was practically of a harmless character.

At about the end of the year measles, with diarrhœa and bowel disturbances as an after symptom, began to show itself. It then spread in a southerly direction, and was still raging up to July last, when I gave over the district to Dr. Wells.

The institutions under my charge were well patronised. At the Soufrière Dispensary 1,224 people applied for treatment, of whom the greatest number were infants and children, brought for treatment for fevers caused by the irritation of teething and worms, and and often also of bad innutritious food.

At the Choiseul Dispensary the number of patients treated was 198, with 175 successful vaccinations.

At the Poor Asylum the number treated was 137; 94 were admitted during the year. The number of indigent and sick paupers must be increasing at the present moment in Saint Lucia by leaps and bounds.

The number of yaws patients treated during the year was 80. The appellation of "yaws patients" is patently a misnomer, as three cases of leprosy were sent to me from Castries for admittance, making a total, with those already in the asylum, of 7 cases treated during the year.

There were 11 deaths at the institution during the year; of these, 7 were due to yaws, 2 to debility and exhaustion consequent on tertiary syphilis, and 2 to leprosy.

At the Lunatic Asylum there were, at the beginning of 1904-4 female inmates; 7 were admitted, making a total of 11 treated during the year. One was discharged and 2 died. The cases treated were mostly epileptics and those suffering from senile dementia.

At the Soufrière Hospital 85 patients were treated, and of those 63 were admitted during the year: 65 were discharged cured or relieved, and there were 18 deaths.

VIEUX-FORT.

A. B. Duprey.

The last census seems to have been taken in the year 1901, the populations of Vieux-Fort and Laborie being then estimated respectively at 3,500 and 3,278 souls. The number of people in Laborie district for 1902 was estimated at 3,324, there being a small increase of 46. The Vieux-Fort and Laborie districts are very sparsely populated and consist of principally a labouring class of people mostly engaged in agriculture.

The births and deaths during the year 1904 as compared to those of 1903 are hereby represented in tabulated form :—

1903.

Districts	Births	Deaths	Birth-rate per 1,000	Death-rate per 1,000
Vieux-Fort	128	53	36·5	15·1
Laborie	142	58	43·3	17·6

1904.

Districts	Births	Deaths	Birth-rate per 1,000	Death-rate per 1,000
Vieux-Fort	117	45	83·1	12·8
Laborie	125	65	38	19·8

There were no serious epidemics during the year; a few cases of influenza occurred in January and February, but these were mild in nature. At the latter part of the year, viz., in August, a few cases of whooping-cough were treated in the dispensaries, but these soon disappeared. Malarial fever was prevalent but usually of a mild intermittent character, chiefly at the end of the year.

There appeared to be more deaths during the latter part of the year, say, between the months of August and November, than at the commencement of the year. Sudden deaths among children occurred fairly frequently, mostly due to untreated malaria contracted in the heights of the districts, and to a great extent also from infection by the *Ascaris lumbricoides*.

Throughout the year there was a want of rain felt in both districts. At Laborie there were more frequent showers than at Vieux-Fort. The highest records occurred during the months of June and August, when the rainfalls were 6·68 and 5·21 inches respectively; the total number of inches for the whole year being 45·27 inches, or 15·21 inches less than the preceding year. The commencement of 1905 was likewise characterised by a drought, the records being 1·69 for January, 1·64 for February, and up to date, March 20th, 1·10 inches. Between January and the middle of March, 1905, there was a constant piercing east wind blowing almost to a half gale; its effect upon the health curve of Vieux-Fort district was distinctly depressing. Bronchial affections and acute tonsillitis were then very frequent.

Malarial Fever.

There were a good many cases of fever treated as usual at both dispensaries, though far less in number than the preceding year. This may be owing to the drought which more or less characterised the greater part of the year, thus lessening the pools and drying up stagnant swamp water. Malaria is, however, latent in most people and only requires some slight depressing cause to bring out the whole phenomena of an attack of malarial fever. Of 1,031 persons seen at the Vieux-Fort Dispensary, 142, or 13·7 per cent., suffered from malaria, and in every case was benefited by quinine. There were two severe cases of fever treated in this hospital.

Dysentery.

This disease is present in sporadic form and in no particular season of the year. There were 14 cases during the year, scattered in different parts in both districts and these received special attention. I have no means of investigating microbic dysentery, but I would only like to suggest here a probable cause of dysentery, whether sporadic or epidemic. Dysentery, if I may be allowed to suggest, has a direct relation to the advance of agriculture in the West Indies. It is noticeably so in hilly countries, especially where large quantities of manure are being used for furthering the growth and keeping up the standard of West Indian products. The heavy rains are apt to wash down the rather loose manure into the streams and rivers, thereby constituting a source of danger to the population lower down who drink these waters. This disaster is to a great extent prevented in this district owing to the nature of the country, which is more or less level. Still, however, the danger exists, and the nature of the manure used, whether chemical or organic, makes little difference.

In the treatment of acute or chronic dysentery, I put great reliance on the use of sublimed sulphur, which in my hands invariably gives excellent results. The method of administering the drug has already been communicated in the Journal of Tropical Medicine in 1901. I have since found though, that the good results obtained do not depend upon the Dover's powder combined with it, but to the virtues of the sulphur alone.

Ankylostomiasis.

This so-called anæmia is widely prevalent in both districts, though cases do not often come to hospital for treatment. In one instance, that of a black man and a labourer, the anæmia was intense and the number of worms passed were few, yet he, however, recovered sufficient strength and colour to be discharged in a week. This man said on admission he could hardly get the necessary food to keep him standing. He improved rapidly on a liberal diet, and one could not doubt that his case was primarily one of starvation.

Lung Disease.

This cannot be said to be of very common occurrence. I have seen some cases of asthma, the treatment of which condition is very unsatisfactory, owing to the irregular attendance of these to the dispensaries.

Venereal.

Gonorrhœal affections are very common indeed and there are many who are crippled from gonorrhœal rheumatism. Ophthalmia and blindness from the same cause are frequent; I have seen 3 cases during the year of total blindness from this cause, one of whom died from pyæmia. Syphilis is exceedingly common and is on the increase. A goodly number are imported by labourers who have returned from Cayenne, but a great many get infected locally. The tertiary manifestations of syphilitic brain disease are sometimes seen; I saw two such cases last year.

Ascarides.

This affection is by far the most common in the districts. In fact, I do not remember any other place where the ascaris is more readily found. It is difficult to assume a cause for this extensive worm disease; sea-coast towns and villages are not more apt to be infested than inland towns and villages, but it is possible that the great quantity of pigs that are reared inside and around the towns may furnish a probable cause. Notter and Firth in, their "Theory and Practice of Hygiene," mention that pigs are infested by the same worm as are human beings and thus the disease is transmitted to man by contamination of "water from streams and ponds," or even the sands and loose earth where potatoes and other vegetables are grown. Not a few cases simulate acute meningitis.

Rheumatism.

I have already drawn attention to the frequency with which children and adults are affected with subacute rheumatism and heart disease. Considering how often it has been stated that acute or subacute rheumatism is not to be found in the Tropics, this should draw particular attention to the fact of its presence.

Yaws.

These were not many; only 5 cases attended the Vieux-Fort Dispensary; at Laborie also there were a few cases. It is a disease that affects the lowest classes and is to be found only in certain islands of the West Indies, and then only in certain localities. Yaws come from the heights of the districts.

The districts of Vieux-Fort and Laborie were fairly healthy during 1904. There is no special sanitary arrangement or water supply. The dry earth system prevails here.

The villages of Vieux-Fort and Laborie are full of small huts negligently built without any due regard to air space per head or to ventilation. A whole family are sometimes crowded in a small hut at night without even a window open to allow the admittance of fresh air, but on the contrary, all crevices are hermetically sealed either with cotton-wool or rags.

Table of diseases treated at Vieux-Fort Dispensary during the year 1904:—

Fevers	192
Worms	162
Digestive	201
Respiratory	84
Circulatory	3
Ulcers	83
Wounds	20
Venereal	30
Rheumatic	41
Headache	13
Gynæcological	27
Kidney	14
Skin	44
Special Senses	24
Debility	24
Toothache	18
Throat	3
Bones and Joints	8
Nervous	13
Fractures	2
Abscess	2
Tumours	4
Strumous	5
Yaws	5
Ankylostomiasis	4
Pregnant	3
Hæmopoietic	6
Total	1,034

Table of diseases treated at the Laborie Dispensary during 1904:—

Fever	86
Worms	98
Digestive	94
Respiratory	26
Circulatory	6
Ulcers	15
Venereal	10
Rheumatic	24
Headache	19
Gynæcological	12
Kidney	8
Skin	25
Special Senses	14
Senility and Debility	26
Toothache	1
Throat	5
Bones and Joints	13
Nervous	15
Abscess	4
Yaws	3
Ankylostomiasis	1
Pregnant	1
Hæmopoietic	5
Hernia	2
Cellular Tissue	4
Cancer	1
Total	518

Numerical Returns.

During the year 1904 there were 1,262 cases admitted into hospital; in the previous year there were 1,639. Only those who urgently required attendance could be admitted, and this led to the exclusion of a large class of "No appreciable disease."

There were 82 deaths in a total of 1,343 cases treated, giving a death-rate of 6·1 per cent. There were 123 operations performed, of which a classification is appended.

The most important diseases treated are syphilis, malaria and intestinal parasites. Pulmonary tubercle is responsible for 16 deaths.

As a working basis it may safely be assumed that every adult labourer in Saint Lucia has had, or is actually suffering from, venereal disease.

(*a*) Soft chancres are not to my knowledge very prevalent; and unless they take on a phagedænic type are not seen by a medical officer, but are treated by the druggists or other bush vendors.

(*b*) Gonorrhœa seldom comes under observation unless complicated.

During the year 1904, 20 cases of stricture were treated in the Victoria Hospital.

Colonial Medical Reports.—No. 26.—Saint Lucia *(continued).*

It is exceedingly rare to come across a woman who has not some pathological condition of the generative organs, or in other words, one who has not been the victim of gonorrhœa, syphilis, or sexual psychopathy.

(*c*) Syphilis is very prevalent, and along with malaria and intestinal parasites constitutes the bulk of cases treated throughout the island.

In 1904 the total number of cases treated in the Victoria Hospital was 1,343; of these malaria accounted for 227, syphilis 321, intestinal parasites 156. This does not represent the true percentage, which is really much higher. Thus, on March 31st, of 68 patients in the hospital, indisputable evidence of syphilis was found in 33, and there were at least 10 others about whom no satisfactory conclusion could be formed.

In the study of West Indian syphilis it is of the greatest importance to realise the certainty and frequency of non-venereal syphilis; neither age nor moral standing is a barrier against contagion. The so-called varieties of "Yaws" are true manifestations of syphilis.

Among certain tribes in Africa early infection with syphilis is practised as a safeguard to the future health of the child, and in the West Indies the same belief prevails with regard to "Yaws."

Of late years it has been noticed that venereal syphilis has been on the increase in the town of Castries. Unfortunately, there are no available statistics. The facility with which work was obtained in the garrison town, which was also a coaling station, attracted large numbers of immigrants, many of whom were wanton vagrants from the neighbouring islands. Among this lot infection became very rife. In 1904 among males there were 20 cases of infection requiring operative interference, even to the extent of amputation of the penis.

The disregard of the populace to all sanitary and precautionary measures against diseases makes it a difficult problem to stamp out or even attempt a reduction in the parasitic affections.

Castries Dispensary.

During the year 1904, 7,102 cases were treated at the Castries dispensary, and 9,626 ulcers were dressed.

It appears needless to classify the ailments treated, as was done in former years under the various systems of the body. The type of cases treated presents no difference from the more correct classification afforded by the hospital returns. The prominent features in both are syphilis, malaria and intestinal parasites.

Colonial Medical Reports.—No. 27.—Basutoland.

MEDICAL REPORT FOR THE YEAR 1905.

By Dr. E. C. LONG.

Principal Medical Officer.

General Health.

The year 1905 was not so healthy as 1904. There were no epidemics of any magnitude or severity, but an increased number of minor ailments.

Speaking broadly, I should say that the general health of the Basuto is tending to a progressively lower standard, and the physical development to-day is inferior to that of the past generation.

This last point is illustrated by the low standard of the recruits seeking admission to the Bechuanaland Police. Of the last 50 candidates examined, all young men between the ages of 22 and 35, 20 per cent. were rejected on account of defective physique or bodily ailments.

I have, for some years now, noticed a decline in the physique of those who have attended school for several years, and I attribute it in part to the overcrowding and deficient ventilation in many of the school buildings.

The increase of tubercular disease in the country during recent years emphasises the danger of these defective buildings. There is a distinct danger that unless steps are taken to render school accommodation better, that the schools will become centres for the spread of tuberculosis.

The question of the cubic space and ventilation of school buildings in relation to the number of pupils is of great importance, more especially in those schools which receive boarders.

Something might be done by insisting on a limit to the number of pupils accommodated in any given building, making the Government grant contingent on this proviso being adopted, and insisting that plans of all school buildings should be first submitted to the Government architect.

RETURN OF DISEASES AND DEATHS IN 1905 AT THE

Basutoland Hospitals.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	—	—	—
Anæmia	1	—	346
Anthrax	—	—	—
Beri-beri	—	—	—
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	—	—	—
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Congenital Malformation	—	—	—
Debility	3	—	498
Delirium Tremens	—	—	—
Dengue	—	—	—
Diabetes Mellitus	2	1	4
Diabetes Insipidus	1	—	1
Diphtheria	—	—	—
Dysentery	4	—	21
Enteric Fever	13	3	17
Erysipelas	8	—	8
Febricula	4	—	275
Filariasis	—	—	—
Gonorrhœa	—	—	420
Gout	1	—	16
Hydrophobia	—	—	—
Influenza	—	—	—
Kala-Azar	—	—	—
Leprosy	—	—	—
(*a*) Nodular	5	—	5
(*b*) Anæsthetic	2	—	2
(*c*) Mixed	5	—	5
Malarial Fever—	1	—	1
(*a*) Intermittent—	—	—	—
Quotidian	—	—	—
Tertian	—	—	—
Quartan	—	—	—
Irregular	—	—	—
Type undiagnosed	—	—	—
(*b*) Remittent	—	—	—
(*c*) Pernicious	—	—	—
(*d*) Malarial Cachexia	—	—	—
Malta Fever	—	—	—
Measles	2	—	277
Mumps	—	—	41
New Growths—	—	—	—
Non-malignant	65	1	200
Malignant	7	3	9
Old Age	—	—	—
Other Diseases	2	—	2
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	2	—	2
Rachitis	—	—	—
Rheumatic Fever	—	—	—
Rheumatism	11	1	954
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	2	—	24
Septicæmia	—	—	—
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox		—	
Syphilis—	—	—	—
(*a*) Primary	6	—	6
(*b*) Secondary	—	—	477
(*c*) Tertiary	26	1	888
(*d*) Congenital	1	—	336
Tetanus	—	—	—
Trypanosoma Fever	—	—	—
Tubercle—	—	—	—
(*a*) Phthisis Pulmonalis	9	1	76
(*b*) Tuberculosis of Glands	19	—	108
(*c*) Lupus	1	—	1
(*d*) Tabes Mesenterica	2	1	3
(*e*) Tuberculous Disease of Bones	12	—	12
GENERAL DISEASES—*continued.*			
Other Tubercular Diseases	—	—	23
Varicella	—	—	—
Whooping Cough	—	—	51
Yaws	—	—	—
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	53	—	367
Circulatory System—	—	—	—
(*a*) Valvular Disease of Heart	9	2	129
(*b*) Other Diseases	4	—	15
Digestive System—	32	6	6,341
(*a*) Diarrhœa	—	—	—
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	—	—	—
Congestion of Liver	—	—	—
(*d*) Abscess of Liver	—	—	—
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	—	—	—
(*g*) Cirrhosis of Liver	—	—	—
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	—	—	—
Ear	2	—	248
Eye	82	—	689
Generative System—	—	—	—
Male Organs	33	—	124
Female Organs	48	1	720
Lymphatic System	5	—	92
Nervous System	25	4	417
Nose	—	—	129
Organs of Locomotion	22	—	73
Respiratory System	20	4	2,319
Skin—	—	—	—
(*a*) Scabies	—	—	125
(*b*) Ringworm	—	—	40
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	3
(*e*) Eczema	—	—	323
(*f*) Other Diseases	1	—	544
Urinary System	5	1	43
Injuries, General, Local—	—	—	—
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	55	3	407
Parasites—	—	—	—
Ascaris lumbricoides	—	—	5
Oxyuris vermicularis	—	—	23
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	—	—	—
Tape-worm	—	—	113
Poisons—			
Snake-bites	—	—	—
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	—	—	4
Surgical Operations—			
Amputations, Major	—	—	—
,, Minor	—	—	1,804
Other Operations	—	—	389
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

At the vacation course for teachers, held at Maseru, in January, 1906, a few lectures on elementary hygiene were included in the course, and the teachers showed great intelligence in appreciating the lessons inculcated in these lectures. A year or so ago a small pamphlet on elementary hygiene was written and translated into Sesuto, but it should be included in one of the compulsory school readers.

Small-pox.

There were only two small outbreaks of this disease during the year. They were promptly stamped out by isolation and vaccination.

Fifteen thousand three hundred and eighty-five vaccinations were performed during the year, and the general condition of the people in this respect is satisfactory.

Enteric Fever.

Comparatively few cases have been recorded, and, as in other years, these were mostly imported cases.

Tuberculosis.

This is still increasing, 199 cases being recorded as against 155 in 1904. Tubercular glands in young people between the ages of 18 and 30 is the most common form.

Leprosy.

Only a few new cases have been noted.

Syphilis.

This disease shows no abatement. It is noteworthy that of some thousands of cases recorded during the year, in only six instances was the primary lesion observed.

The increased number of cases of congenital syphilis shows that a large number of people go untreated. The secondary manifestations are usually so mild that the people neglect them, and only come up for treatment for severe tertiary lesions.

Scurvy.

Very few cases came under notice, and those were all imported from the various labour centres.

Rheumatism.

All forms of rheumatism have been very prevalent. The acute cases are seldom seen, but judging by the large amount of valvular disease of the heart, they must be fairly common.

Lymphatic System.

A case of lymph scrotum was admitted into the Maseru Hospital in December, 1905. The blood was carefully examined for filariæ, but with negative results. He is a well-nourished young man, aged about 22, and the swelling was first noticed eight years ago, and has been gradually increasing in size. The tunica vaginalis contained an ounce of colourless serum.

This case is interesting, taken in connection with one of elephantoid swelling of the foot reported some years ago, in which filariæ were thought to have been observed in the blood. Specimens of the blood of this patient were forwarded to Sir P. Manson, who was, however, unable to confirm the presence of filariæ.

I have quite recently heard of a supposed case of elephantiasis of the leg in a native in Letsie's ward. My informant, who had spent some years in Central Africa, states that it is exactly like the cases he was accustomed to see there. I am endeavouring to get this patient under observation, and if successful a report with specimens of the blood will be forwarded for examination.

Urinary System.

An interesting fact has been elicited in connection with Bright's disease. It is that the patients are invariably chiefs or well-to-do natives who indulge largely in a meat diet. It is practically unknown amongst the common people.

Male Generative System.

A successful case of enucleation of the prostate was undertaken in the Maseru Hospital. The patient, aged 65, prior to the operation had two ounces of residual urine. Urine was passed by the normal channel fourteen days after the operation, and when the patient left the hospital there was no residual urine.

Diseases of the Eye.

Forty-five cases of cataract were operated on during the year. They were all of the senile variety, except one congenital cataract. The results were uniformly good, only one eye being lost from suppuration.

Glaucoma is still frequently met with, but only three cases were benefited by treatment. The remaining cases all came up for treatment after the glaucoma had been absolute for some years.

Meteorological Return for the Year.

	Temperature				Rainfall *
	Shade Maximum	Shade Minimum	Range	Mean	Amount in Inches
January ..	101	50	51	75	4·54
February ..	90	53	37	71	9·20
March ..	89	45	44	67	4·26
April	80	40	40	60	·96
May	81	26	55	53	1·19
June	85	20	65	53	·21
July	72	22	50	48	
August ..	78	22	56	48	·21
September ..	88	25	63	57	2·02
October ..	92	31	61	64	·41
November ..	95	43	52	69	1·81
December ..	96	45	51	72	5·28

* Total rainfall 30·09 inches.

Colonial Medical Reports.—No. 28.—Grenada.

RETURN OF DISEASES AND DEATHS IN 1905 AT COLONY, YAWS, ST. ANDREWS, AND CARRIACON HOSPITALS.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	1	—	1
Anæmia	16	—	18
Anthrax	—	—	—
Beri-beri	—	—	—
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken pox	—	—	—
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Congenital Malformation	—	—	—
Debility	5	—	6
Delirium Tremens	—	—	—
Dengue	—	—	—
Diabetes Mellitus	1	—	1
Diabetes Insipidus	—	—	—
Diphtheria	—	—	—
Dysentery	12	5	12
Enteric Fever	—	—	—
Erysipelas	—	—	—
Febricula	—	—	—
Filariasis	—	—	—
Gonorrhœa	14	—	14
Gout	—	—	—
Hydrophobia	—	—	—
Influenza	—	—	—
Kala-Azar	—	—	—
Leprosy	—	—	—
(*a*) Nodular	—	—	—
(*b*) Anæsthetic	—	—	—
(*c*) Mixed	—	—	—
Malarial Fever—	103	—	109
(*a*) Intermittent	—	—	—
Quotidian	—	—	—
Tertian	—	—	—
Quartan	—	—	—
Irregular	—	—	—
Type undiagnosed	—	—	—
(*b*) Remittent	7	—	7
(*c*) Pernicious	1	—	1
(*d*) Malarial Cachexia	—	—	—
Malta Fever	—	—	—
Measles	—	—	—
Mumps	—	—	—
New Growths—	—	—	—
Non-malignant	18	—	18
Malignant	10	2	10
Old Age	—	—	—
Other Diseases	—	—	—
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	1	1	1
Rachitis	—	—	—
Rheumatic Fever	3	—	3
Rheumatism	22	—	24
Rheumatoid Anthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	—	—	—
Septicæmia	2	2	2
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox	—	—	—
Syphilis	—	—	—
(*a*) Primary	11	—	12
(*b*) Secondary	25	—	27
(*c*) Tertiary	43	5	45
(*d*) Congenital	13	—	14
Tetanus	1	1	1
Trypanosoma Fever	—	—	—
Tubercle—	—	—	—
(*a*) Phthisis Pulmonalis	3	—	3
(*b*) Tuberculosis of Glands	3	3	3
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculosis Disease of Bones	1	—	1
GENERAL DISEASES—*continued.*			
Other Tubercular Diseases	—	—	—
Varicella	—	—	—
Whooping Cough	—	—	—
Yaws	—	—	—
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	36	—	40
Circulatory System—	—	—	—
(*a*) Valvular Disease of Heart	31	4	32
(*b*) Other Diseases	9	2	9
Digestive System—	—	—	—
(*a*) Diarrhœa	1	—	1
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	5	1	5
Congestion of the Liver	—	—	—
(*d*) Abscess of Liver	3	2	3
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	2	—	2
(*g*) Cirrhosis of Liver	2	—	3
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	1	1	1
(*j*) Other Diseases	64	10	74
Ear	2	—	2
Eye	26	—	34
Generative System—	—	—	—
Male Organs	28	—	28
Female Organs	59	1	62
Lymphatic System	13	—	15
Nervous System	19	4	21
Nose	3	—	3
Organs of Locomotion	26	1	28
Respiratory System	36	1	44
Skin—	—	—	—
(*a*) Scabies	8	—	8
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	5	—	5
(*f*) Other Diseases	156	—	176
Urinary System	74	3	79
Injuries, General, Local—	52	2	57
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	—	—	—
Parasites—	222	—	222
Ascaris lumbricoides	283	—	283
Oxyuris vermicularis	76	—	76
Dochmius duodenalis, or Ankylostoma duodenale	247	—	253
Dracunculus medinensis (Guinea-worm)	—	—	—
Tape-worm	—	—	—
Poisons—			
Snake-bites	—	—	—
Corrosive Acids	—	—	—
Metallic Poisons	1	1	1
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	—	—	—
Surgical Operations—			
Amputations, Major	—	—	—
,, Minor	—	—	—
Other Operations	—	—	—
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

Colonial Medical Reports.—No. 28.—Grenada—*(continued).*

POPULATION FOR THE YEAR 1905.

Number of inhabitants in 1904	68,253
Number of births during the year 1905 ...	2,863
,, deaths	1,586
,, inhabitants in 1905	69,530
Increase of ,, ,, ...	1,277

METEOROLOGICAL RETURN FOR THE YEAR 1904.*

	Temperature						Rainfall		Winds		Remarks
	Solar Maximum	Solar Minimum on Grass	Shade Maximum	Shade Minimum	Range	Mean	Amount in Inches	Degree of Humidity	General Direction	Average Force	
January	141·2	136·0	81·9	71·9	10·0	·698	2·92	71·4	E.	114	
February	145·0	133·2	81·2	70·2	11·0	·667	2·11	69·2	E.	155	
March	140·5	132·2	82·2	71·8	10·4	·737	4·70	77·6	E.	154	
April	140·1	120·0	83·6	73·9	9·7	·756	2·95	74·6	N.E.	140	
May	140·3	134·2	83·9	74·7	9·2	·741	4·61	73·4	E.	143	
June	137·8	130 0	83·6	74·7	8·9	·774	6·64	78·6	E.	135	
July	137·4	120·0	83·7	74·9	8·8	·793	10·28	80·3	E.	112	
August	138·2	125·0	84·5	75·0	9·5	·787	11·64	78·1	E.	98	
September	142·5	128·0	84·8	75·0	9·8	·799	5·42	76·2	E.	91	
October	144·8	127·0	84·9	75·3	9·6	·805	8·73	76·8	E.	89	
November	142·5	118·0	83·7	74·9	8 8	1·033	12·23	95·0	E.	58	
December	140·7	120·0	82·0	72·9	9·1	·775	5·66	78·3	E.	97	
Averages	140·9	126·9	83·3	73·7	9·6	·780	77·89	77·4	E.	115	

* At Richmond Hill Meteorological Station in the south of the island.

Colonial Medical Reports.—No. 29.—Cyprus.

MEDICAL REPORT FOR THE YEAR 1905.

By the CHIEF MEDICAL OFFICER.

PUBLIC HEALTH.

THE health of the island during the past year has, on the whole, been satisfactory, as, with the exception of an outbreak of measles, generally speaking of a mild type, which prevailed at the early part of the year almost throughout the whole of the island, and sporadic cases of typhoid fever, with conspicuously rare cases of diphtheria, no other infectious or contagious zymotic disease occurred during the year under report.

Malarial fevers, however, owing to the frequent late rains, were prevalent, particularly in the western portion of the island, where also the rains were more abundant. Unfortunately, the rural population, as a whole, place little importance on this disease, which is considered as a natural course of things, and not the slightest prophylactic precautions are taken to avoid it.

The opinions expressed by the different medical officers on the subject of the general health have been satisfactory, and I submit reports from the districts of Nicosia and Larnaca.

HOSPITALS AND OUT-DOOR DISPENSARIES.

In the six hospitals, 1,945 patients were treated, 118 deaths occurred, and 261 surgical operations were

Return of Diseases and Deaths for 1905 in Eight Rural Divisions of Cyprus.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	—	—	2
Anæmia	—	—	192
Anthrax	—	—	—
Beri-beri	—	—	—
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	—	—	22
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Congenital Malformation	—	—	—
Debility	—	—	432
Delirium Tremens	—	—	—
Dengue	—	—	—
Diabetes Mellitus	—	—	8
Diabetes Insipidus	—	—	—
Diphtheria	—	—	—
Dysentery	—	—	94
Enteric Fever	—	—	37
Erysipelas	—	—	32
Febricula	—	—	136
Filariasis	—	—	—
Gonorrhœa	—	—	103
Gout	—	—	6
Hydrophobia	—	—	—
Influenza	—	—	381
Kala-Azar	—	—	—
Leprosy	—	—	—
(*a*) Nodular	—	—	—
(*b*) Anæsthetic	—	—	6
(*c*) Mixed	—	—	3
Malarial Fever—	—	—	—
(*a*) Intermittent—	—	—	—
Quotidian	—	—	515
Tertian	—	—	272
Quartan	—	—	102
Irregular	—	—	151
Type undiagnosed	—	—	789
(*b*) Remittent	—	—	108
(*c*) Pernicious	—	—	8
(*d*) Malarial Cachexia	—	—	—
Malta Fever	—	—	—
Measles	—	—	221
Mumps	—	—	—
New Growths—	—	—	—
Non-malignant	—	—	21
Malignant	—	—	4
Old Age	—	—	—
Other Diseases	—	—	15
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	—	—	5
Rachitis	—	—	—
Rheumatic Fever	—	—	31
Rheumatism	—	—	132
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	—	—	—
Septicæmia	—	—	3
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox	—	—	—
Syphilis—	—	—	—
(*a*) Primary	—	—	13
(*b*) Secondary	—	—	43
(*c*) Tertiary	—	—	—
(*d*) Congenital	—	—	4
Tetanus	—	—	—
Trypanosoma Fever	—	—	—
Tubercle—	—	—	57
(*a*) Phthisis Pulmonalis	—	—	—
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculous Disease of Bones	—	—	—
Other Tubercular Diseases	—	—	—
Varicella	—	—	—
Whooping Cough	—	—	—
Yaws	—	—	—
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated
Diseases of the—			
Cellular Tissue	—	—	124
Circulatory System—	—	—	86
(*a*) Valvular Disease of Heart	—	—	—
(*b*) Other Diseases	—	—	—
Digestive System—	—	—	950
(*a*) Diarrhœa	—	—	—
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	—	—	—
Congestion of Liver	—	—	—
(*d*) Abscess of Liver	—	—	—
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	—	—	—
(*g*) Cirrhosis of Liver	—	—	—
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	—	—	—
Ear	—	—	74
Eye	—	—	620
Generative System—	—	—	—
Male Organs	—	—	32
Female Organs	—	—	64
Lymphatic System	—	—	77
Nervous System	—	—	511
Nose	—	—	45
Organs of Locomotion	—	—	47
Respiratory System	—	—	659
Skin—	—	—	743
(*a*) Scabies	—	—	—
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	—	—	—
(*f*) Other Diseases	—	—	—
Urinary System	—	—	56
Injuries, General, Local—	—	—	498
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	—	—	—
Parasites—	—	—	53
Ascaris lumbricoides	—	—	—
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	—	—	—
Tape-worm	—	—	—
Poisons—			
Snake-bites	—	—	—
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	—	—	1
Surgical Operations—			
Amputations, Major	—	—	98
,, Minor	—	—	
Other Operations	—	—	—
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

performed. In the six district dispensaries 22,919 patients attended, whilst in the eight rural divisions 8,686 patients were visited by the rural medical officers during the year, the whole of these received medicines gratis.

Leper Farm.

The number of inmates in the farm on December 31st, 1904, was 109; there were 13 admissions during the year, 9 deaths occurred, whilst 112 remained on December 31st, 1905.

The general health was very satisfactory, as also that of the children of lepers who have been now for some time removed from the Leper Farm to a separate house in the town; they continue to be very healthy, without as yet showing the slightest sign of leprosy, and their elementary education is looked after by one of the attendants, who also acts as governess.

Lunatic Wards.

There were 19 admissions during the year to this institution, and 15 were discharged relieved or cured; 1 death occurred and 42 remained in the wards on December 31st, 1905.

The health of all the inmates was good, notwithstanding that many cases are brought in in a very debilitated condition, and the wards had more inmates than the accommodation should hygienically permit.

Quarantine.

Owing to the continuation of plague in Egypt, all arrivals thence were subjected to medical inspection and the disinfection of susceptible articles.

Three cases of small-pox were detected aud promptly dealt with at the quarantine ports; the disease did not enter the island.

Vaccination.

During the year 7,837 vaccinations were performed, of these, 7,420 were primary operations, whilst 417 were revaccinations.

Of these operations 6,739 were reported as being successful, 607 as unsuccessful, whilst 491 were not seen by the vaccinators a second time.

Animal Disease.

The veterinary surgeon's report, which I submit, deals fully with this subject.

Chemical Laboratory.

This branch of the department continues its most useful work with ever increasing satisfactory results.

NICOSIA.

Report by Dr. Robert A. Cleveland, District Medical Officer.

The general health of this district for this year has been fairly satisfactory. In the earlier months of the year there was an epidemic of measles which, I believe, was general throughout the island. No patients with this disease were admitted to hospital, and only 8 cases attended the out-patient department. There were many cases seen by me in private practice.

Meteorological Return for the Year 1905.

	Temperature						Rainfall		Winds		Remarks
	Solar Maximum	Minimum on Grass	Shade Maximum	Shade Minimum	Range	Mean	Amount in Inches	Degree of Humidity	General Direction	Average Force	
January	..	..	55·9	36·8	19·1	46·4	1·62	81·4	Nly. Ely. Wly.	1·5	
February	..	..	58·1	36·0	22·1	47·1	2·18	80·8	Wly. Ely.	1·0	
March	..	..	63·9	41·7	22·2	52·8	1·49	80·5	Nly. Ely. Wly.	1·7	
April	..	..	74·0	47·2	26·8	60·6	1·94	70·8	Ely. Wly.	1·7	
May	..	..	86·1	55·6	30·5	70·9	0·50	58·0	Wly.	1·7	
June	..	..	88·9	60·8	28·1	74·9	0·00	60·1	Wly.	2·2	
July	..	..	97·4	67·4	30·0	82·4	0·00	54·6	Wly.	1·7	
August	..	..	98·9	67·5	31·4	83·2	0·00	57·4	Wly.	1·5	
September	..	..	93·2	63·1	30·1	78·2	0·18	59·2	Wly.	1·3	
October	..	..	83·8	58·1	25·7	71·0	1·27	67·0	Wly.	1·2	
November	..	..	76·7	51·5	25·2	64·1	2·82	80·3	Sly. Wly.	0·9	
December	..	..	59·1	41·4	17·7	50·3	2·57	77·3	Nly. Wly. Sly.	1·1	
Year	..	..	78·0	52·3	25·7	65·2	14·57	69·0	Wly.	1·5	

Return of Diseases and Deaths in 1905 at the six District Dispensaries,

Cyprus.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	—	—	—
Anæmia	—	—	241
Anthrax	—	—	—
Beri-beri	—	—	—
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken pox	—	—	2
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Congenital Malformation	—	—	—
Debility	—	—	649
Delirium Tremens	—	—	—
Dengue	—	—	—
Diabetes Mellitus	—	—	—
Diabetes Insipidus	—	—	—
Diphtheria	—	—	5
Dysentery	—	—	363
Enteric Fever	—	—	25
Erysipelas	—	—	25
Febricula	—	—	—
Filariasis	—	—	—
Gonorrhœa	—	—	152
Gout	—	—	—
Hydrophobia	—	—	—
Influenza	—	—	1,416
Kala-Azar	—	—	—
Leprosy	—	—	—
(*a*) Nodular	—	—	—
(*b*) Anæsthetic	—	—	—
(*c*) Mixed	—	—	—
Malarial Fever—	—	—	—
(*a*) Intermittent	—	—	—
Quotidian	—	—	1,874
Tertian	—	—	1,004
Quartan	—	—	100
Irregular	—	—	120
Type undiagnosed	—	—	1,033
(*b*) Remittent	—	—	684
(*c*) Pernicious	—	—	21
(*d*) Malarial Cachexia	—	—	—
Malta Fever	—	—	—
Measles	—	—	48
Mumps	—	—	9
New Growths—	—	—	—
Non-malignant	—	—	49
Malignant	—	—	34
Old Age	—	—	—
Other Diseases	—	—	11
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	—	—	—
Rachitis	—	—	—
Rheumatic Fever	—	—	37
Rheumatism	—	—	640
Rheumatoid Anthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	—	—	14
Septicæmia	—	—	1
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox	—	—	—
Syphilis	—	—	—
(*a*) Primary	—	—	125
(*b*) Secondary	—	—	133
(*c*) Tertiary	—	—	—
(*d*) Congenital	—	—	45
Tetanus	—	—	2
Trypanosoma Fever	—	—	—
Tubercle—	—	—	140
(*a*) Phthisis Pulmonalis	—	—	—
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculous Disease of Bones	—	—	—
General Diseases—continued.			
Other Tubercular Diseases	—	—	—
Varicella	—	—	—
Whooping Cough	—	—	—
Yaws	—	—	—
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	—	—	612
Circulatory System—	—	—	343
(*a*) Valvular Disease of Heart	—	—	—
(*b*) Other Diseases	—	—	—
Digestive System—	—	—	3,234
(*a*) Diarrhœa	—	—	—
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	—	—	—
Congestion of the Liver	—	—	—
(*d*) Abscess of Liver	—	—	—
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	—	—	—
(*g*) Cirrhosis of Liver	—	—	—
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	—	—	—
Ear	—	—	496
Eye	—	—	2,213
Generative System—	—	—	—
Male Organs	—	—	142
Female Organs	—	—	256
Lymphatic System	—	—	286
Nervous System	—	—	531
Nose	—	—	131
Organs of Locomotion	—	—	147
Respiratory System	—	—	1,415
Skin—	—	—	1,684
(*a*) Scabies	—	—	—
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	—	—	—
(*f*) Other Diseases	—	—	—
Urinary System	—	—	193
Injuries, General, Local—	—	—	575
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	—	—	—
Parasites—	—	—	160
Ascaris lumbricoides	—	—	—
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	—	—	—
Tape-worm	—	—	—
Poisons—			
Snake-bites	—	—	—
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	—	—	2
Surgical Operations—			
Amputations, Major	—	—	—
,, Minor	—	—	149
Other Operations	—	—	18
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

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THE epidemic was of a fairly mild type, and I saw no case of death from the disease.

There was no case of diphtheria during the year as far as the hospital statistics show, and I saw no case in private practice.

Typhoid fever is responsible for 3 deaths of patients treated in hospital, of which there were 8 cases. I have seen a good number of cases outside the hospital, and I believe the disease was fairly prevalent throughout the whole year. There was no case, however, amongst prisoners. I believe the Nicosia Town water supply to be pure till it reaches the aqueducts for distribution throughout the town, when it becomes liable to contamination. Some of the cases seen by me were no doubt traceable to the use of shallow well waters.

Malarial fevers seem to have been common in the towns and villages, chiefly in the hotter months, from June to October; cases, however, occur throughout the year. Where possible, a microscopical diagnosis is made, but it is impossible to deal with every case in this way, but all cases admitted to hospital are so diagnosed. In this connection an effort was made by me to institute a system of mosquito destruction during the spring and summer, and I was materially assisted by the Municipal Commission of the town of Nicosia. In one instance millions of Anopheles larvæ were discovered in the month of August in pools, caused by leakage from the town aqueduct. These were promptly destroyed, and the pools filled in, and the leak in the aqueduct stopped.

I am of opinion that the health of the towns and districts might be improved by the adoption of some system of mosquito prevention and destruction. In other parts of the world such efforts have been attended with success, as in the case of Havanna, Ismalia, and Port Smeltenham, and I believe the matter is worthy of the consideration of this Government.

NICOSIA GENERAL HOSPITAL.

This institution has been of service to the inhabitants of the town and district, and in not a few instances patients have travelled long distances, and even from other districts of the Island in order to get treatment. The number of beds is small and the figures remain much the same as last year. The hospital buildings are badly in need of repair and repainting, it being some years since this was thoroughly done, and I trust money will be available in the next financial year to carry out this very necessary work. I also beg again to draw attention to the absence of proper accommodation for the treatment of women, and also to the state of the floors of all parts of the building.

The dispensary and out-patients' departments are much in need of re-painting, but in other respects the buildings are in good repair.

In this department 6,359 dressings were applied, and the Nurse of the Colonial Nursing Association (Cyprus Branch) is employed in the out-patient department, when her services are not required outside the hospital. A total of 4,517 patients attended for more than one visit.

TABLE SHOWING TOTAL NUMBER OF IN- AND OUT-PATIENTS TREATED AT THE NICOSIA GENERAL HOSPITAL IN THE YEAR 1905.

	Civilian	Deaths	Police	Deaths	Total	Total Deaths
In-patients ..	287	29	204	0	491	29
Out-patients ..	6,011	0	435	0	6,446	0
					6,937	29

TABLE SHOWING THE ABOVE TOTAL AND THOSE OF PREVIOUS YEARS.

Year	Total In- and Out-patients	Deaths
1900	5,511	31
1901	5,989	22
1902	6,568	25
1903	6,769	20
1904	7,297	22
1905	6,937	29

Report by George A. Williamson, District Medical Officer.

GENERAL REMARKS.

As in former years, the diseases bulking largely are malarial fever, diseases of the digestive and respiratory systems, neuralgia, debility, diseases of the eye, of the cellular tissue, and of the skin.

SEASONAL PREVALENCE.

Purulent conjunctivitis, the seasonal prevalence of which may be given as from the middle of August to the middle of November, was not so frequently met with this summer as usual.

As might be expected, diseases of the respiratory system occurred chiefly during the late autumn, winter and spring.

Influenza appeared in epidemic form during the first quarter of the year, 100 out of the year's total of 117 cases being treated during these three months.

Fibricule was observed during the whole year, but was commoner during the first six months.

Dysentery, of which only 29 cases were treated during the year, occurred chiefly from April to August, 22 of the cases being treated during that period.

Rheumatism was seen chiefly during the early months of the year.

On the other diseases (except malarial fever, to which I refer in the next paragraph) season appeared to have no special influence.

MALARIAL FEVER.

The Malarial Incidence Chart for 1905, which I submit, is of the type I have formerly shown to be characteristic of the disease in Larnaca. The outstanding features are: (1) The presence of cases during January and February; (2) the almost entire

Return of Diseases and Deaths in 1905 at the Hospitals, Including the Lunatic Asylum and Leper Farm.—**Cyprus.**

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	—	—	—
Anæmia	16	3	17
Anthrax	—	—	—
Beri-beri	—	—	—
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken pox	—	—	—
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Congenital Malformation	—	—	—
Debility	40	7	42
Delirium Tremens	—	—	—
Dengue	—	—	—
Diabetes Mellitus	1	—	1
Diabetes Insipidus	—	—	—
Diphtheria	—	—	5
Dysentery	30	1	30
Enteric Fever	29	7	29
Erysipelas	10	—	10
Febricula	13	—	13
Filariasis	—	—	—
Gonorrhœa	31	—	34
Gout	—	—	—
Hydrophobia	—	—	—
Influenza	80	2	85
Kala-Azar	—	—	—
Leprosy	—	—	—
(*a*) Nodular	9	5	58
(*b*) Anæsthetic	4	4	64
(*c*) Mixed	—	—	—
Malarial Fever—	—	—	—
(*a*) Intermittent	—	—	—
Quotidian	112	—	112
Tertian	52	—	52
Quartan	15	1	19
Irregular	10	1	10
Type undiagnosed	57	—	57
(*b*) Remittent	48	—	49
(*c*) Pernicious	21	—	21
(*d*) Malarial Cachexia	4	—	4
Malta Fever	—	—	—
Measles	4	1	4
Mumps	1	—	1
New Growths—	—	—	—
Non-malignant	8	—	8
Malignant	15	—	15
Old Age	—	—	—
Other Diseases	11	—	12
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	—	—	—
Rachitis	—	—	—
Rheumatic Fever	10	—	12
Rheumatism	34	—	34
Rheumatoid Anthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	—	—	—
Septicæmia	2	1	3
Sleeping Sickness	2	—	3
Sloughing Phagedæna	—	—	—
Small-pox	—	—	—
Syphilis	—	—	—
(*a*) Primary	9	—	9
(*b*) Secondary	8	—	9
(*c*) Tertiary	—	—	—
(*d*) Congenital	2	—	2
Tetanus	—	—	—
Trypanosoma Fever	—	—	—
Tubercle—	15	2	15
(*a*) Phthisis Pulmonalis	—	—	—
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculous Disease of Bones	—	—	—
Other Tubercular Diseases	—	—	—
Varicella	—	—	—
Whooping Cough	—	—	—
Yaws	—	—	—
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	162	8	171
Circulatory System—	—	—	—
(*a*) Valvular Disease of Heart	8	3	9
(*b*) Other Diseases	14	2	14
Digestive System—	—	—	—
(*a*) Diarrhœa	20	—	20
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	6	—	6
Congestion of the Liver	—	—	—
(*d*) Abscess of Liver	1	—	1
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	3	—	3
(*g*) Cirrhosis of Liver	3	2	3
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	121	13	123
Ear	—	—	—
Eye	119	—	130
Generative System—	7	—	7
Male Organs	32	—	32
Female Organs	14	—	14
Lymphatic System	25	—	25
Nervous System	52	4	91
Nose	4	—	4
Organs of Locomotion	33	—	38
Respiratory System	108	18	116
Skin—	18	—	18
(*a*) Scabies	—	—	—
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	—	—	—
(*f*) Other Diseases	—	—	—
Urinary System	46	11	47
Injuries, General, Local—	—	—	—
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	235	16	249
Parasites—	—	—	—
Ascaris lumbricoides	1	—	1
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	—	—	—
Tape-worm	—	—	—
Poisons—			
Snake-bites	1	—	1
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	5	—	5
Surgical Operations—			
Amputations, Major	8	—	10
,, Minor	210	—	207
Other Operations	4	—	4
Eye	—	—	—
(*a*) Cataract	7	—	7
(*b*) Iridectomy	1	—	1
(*c*) Other Eye Operations	24	—	26

absence during March, April, May, and the first half of June; (3) the large increase in the number of cases in July, August, September, and October; (4) the considerable fall in November with a slight rise in December.

The heavy *late* spring rains of 1905 have had the result that such rains practically invariably have, of causing a severe malarial summer and autumn.

I have been much struck by the large proportion of cases of æstivo-autumnal fever and the very few cases of quartan fever this year. The former has greatly increased and the latter considerably diminished, while tertian fever retains more or less its usual proportion to the total number of cases of malarial fever, or is, perhaps, slightly less than ordinary.

I am quite unable to give any explanation of this distribution of the several types of malaria this year. All that can be said is that quartan fever is more typical of a cold malarial country, and æstivo-autumnal of a tropical malarial country, while it is probable that tertian fever occurs more commonly where there is a warm climate, with, however, a distinct difference in temperature between winter and summer.

During the year I have endeavoured to explain to the patients the method by which malarial fever is carried and the consequent rational means by which infection may be avoided. My object was to try to lessen the incidence, but I can truthfully say that the most intelligent remark made was simply "Just fancy!" and I am sure not one person followed the advice given.

Not only did my attempts at making the natives adopt preventive measures fail, but even in treatment they preferred to be guided by their own ignorance.

I fear that a people who will neither carry out the prophylactic measures explained to them, nor even take the trouble to come for the medicine which is supplied gratis to them, must continue to suffer: my sympathy lies with the poor children whose parents so neglect them, and whose lives are so frequently jeopardised by this criminal carelessness.

Would the people but use (such of them as possess nets) mosquito-nets and carry out the medical instructions as to treatment, the incidence and recurrence of malarial fever would both be remarkably diminished.

It has been asserted that malarial fever and cancer are not found together—an assertion with which my experience does not agree; but I may mention in this connection that only one case of cancer has come to my notice during the year. It is reported on elsewhere.

Bacteriological Work.

I have, since 1900, done a considerable amount of bacteriological work, having fitted up, at my own expense, a laboratory here. It has been very gratifying to find that such facilities to diagnosis as the bacteriological work gives has been appreciated by several of the medical practitioners. Thus, besides from medical men in Larnaca, I have received specimens for examination from Limassol, Polymedia, and Troödos.

The Public Health.

The public health in this district has been, apart from the large amount of malarial fever, good; no cases of diphtheria occurred during the year. Chicken-pox and measles occurred in Larnaca and in several villages, but most of the cases were mild. Enteric fever occurred less frequently than last year, and never reached epidemic form. Conjunctivitis was somewhat less than in 1904.

I have in former reports drawn attention to the absence of means by which the birth rate, marriage rate, and death rate can be calculated. These vital statistics are of very considerable value.

The District Hospital has been taken advantage of, as in former years, by large numbers of the sick poor, and is admitted to be a boon to the town and district.

Report by George J. Harvey, Veterinary Surgeon.

The animals inspected by me for exportation were: sheep, 6,894; lambs, 1,651; goats, 259; oxen, 1,253; pigs, 1,205; donkeys and mules inspected being 6 and 11 respectively.

Lambs were exported principally in March, April, May and June. Pigs all the year, bar June, July and August, and oxen all the year round.

There would have been far larger exportations but for quarantine having to be carried out in Egypt on Cyprus animals, when there were one or two local outbreaks of quarter-ill, anthrax and sheep-pox here. The law at present requires that the infected places, where only one or two animals die, should be gazetted and quarantined before legalised restrictions and penalties can be enforced, preventive measures taken, and the safe destruction of dead bodies enforced.

Thus, in one small place, such quarantine affects the export of the whole island.

A law as to the disposal of the body of any animal dying suddenly or within twenty-four hours from any unknown cause, by burial of the carcase whole, with lime if possible, and with penalties against the owner for not reporting or doing it, would save the villagers thousands of pounds a year.

The diseases prevalent during the past year have been quarter-ill, sheep- and goat-pox, and strangles, anthrax, generally distributed from Papho to the Carpas, and where the blacklegine vaccine has been used it has been most successful, and I have heard of no case of death after inoculation this year.

Sheep- and goat-pox have fortunately only appeared in an endemic form, and not generally, and been kept under control.

This I attribute to the instruction given by this office to the villagers in the method of preventive vaccination, which differs from their old method.

Strangles was very prevalent in the spring, and I attribute its spread to the movement of the Zaptiehs' horses. Whether it originated in the villages or towns I cannot say, but nearly all the Zaptiehs' horses were affected, and spread it. It may have been introduced by the imported Syrian horses.

Anthrax has only been reported in a few cases. The Government introduced some 500 double doses of vaccine, which was offered free to the native popu-

lation by advertisement, but only fifteen doses were used.

Report by W. Francis, Government Analyst and Lecturer in Chemistry.

I submit my report on the work done in the Government Analytical and Bacteriological Laboratory during 1905.

During the past year 239 samples were analysed, and 18 bacteriological examinations were made for the Government. One hundred and fifty-eight preparations of a chemical or bacteriological nature were made.

The number of private samples analysed was 23, and in connection with two of which I gave evidence in court.

One hundred and fifty-eight exhibits were received from the police for analyses and examination. For several years past cases of poisoning animals have been reported in the Limassol and Papho districts, but, thanks to the prompt action of the police in seizing all poisons from unauthorised persons, this serious practice has now ceased. At the request of the Chief Commandant of Police, I made, some years ago, a preparation for taking footprints in connection with criminal cases. The preparation was found to be satisfactory, except that in very warm weather it would not set quickly without the aid of cold water. I am now experimenting with a view of making a composition that will set in the warmest weather without the aid of a cooling agent. The new Food and Drugs Law came into force on January 1st, 1906.

The question of the purity of the water supplies has, as in previous years, occupied my attention. I have analysed forty-eight samples taken from wells in different parts of the Island. Samples of water taken from the source of supply are pure, but are often contaminated by bad earthenware pipes before consumption. For this reason I would suggest that filters be more universally used. Mr. J. A. Wanklyn, the famous water analyst, made many investigations concerning the removal of germs of disease and organic matter from water by filtration through silicated carbon. The result of all his experiments proved conclusively the great benefits that can be derived from the use of good filters. I would strongly suggest that filters be attached to all drinking fountains, and this would greatly improve the public health.

A considerable number of soils have been analysed during the year, both from manured and unmanured land.

The poorer soils are deficient in nitrogenous matter and phosphates.

Colonial Medical Reports.—No. 30.—Seychelles.

MEDICAL REPORT FOR THE YEAR 1905.

By Dr. J. E. ADDISON.

Acting Chief Medical Officer.

Vital Statistics.

The estimated population on December 31st, 1905, was 20·767, being an increase of 349 over the preceding year.

Annexure I. gives the number of persons who arrived at and left Seychelles, and the number of births and deaths during the year.

The birth-rate was 33·30 per thousand, and was lower than that of 1904, which was 34·92 per thousand.

The average birth-rate for the last seven years has been 31·94 per thousand.

The death-rate shows a satisfactory decrease, being 14·98 per thousand against 16·12 in 1904.

The average death-rate for the last seven years has been 17·21 per thousand.

The mortality among infants and young children was higher during this year, the number of children who died before reaching the age of five years was 126, being an increase of 31 on last year.

The number of juvenile deaths during the last seven years has been as follows:—1899, 121; 1900, 120; 1901, 148; 1902, 122; 1903, 155; 1904, 95; 1905, 126.

The principal causes of the mortality were to be found in intestinal complaints, chiefly due to worms and injudicious feeding, and to the epidemic of whooping-cough which was prevalent during the last two months of the year.

There were fifty-four still births and seven twin births during the year.

Meteorological Statistics.

Annexure II. shows that the year 1905 was warmer and drier than 1904. The mean temperature was 79·9, against 77·66 for 1904, which was the lowest temperature recorded.

Colonial Medical Reports.—No. 30.—Seychelles *(continued)*.

The total rainfall for the year was only 88·91 inches, against 107·05 inches for 1904. The rainfall was 18·14 inches less than last year.

The rainfall for the last seven years has been as follows:—1899, 88·41; 1900, 111·75; 1901, 102·26; 1902, 87·81; 1903, 132·96; 1904, 107·05; 1905, 88·91.

The average rainfall for the last seven years is 102·73 inches.

The south-east trade wind commenced to blow early in May, and continued until the end of November. It was not so strong and steady as is usually the case.

Prevalence of Sickness at Different Seasons.

The only epidemic disease which prevailed in the Island during the year was whooping cough, which commenced in the month of November, and continued till the end of the year, this disease not having visited the colony for very many years; the number of cases was large.

The type of the disease was severe, and it is interesting to note that in a precisely similar way to the measles, of which there was an epidemic some three years ago, the complications of the disease did not fall, as is usually the case, on the respiratory, but on the digestive system; a very large number of children were attacked, usually about the third or fourth week of their illness, by a form of enteritis, accompanied by the passage of blood and mucus in the stools, and, as might be expected, the children who harboured a number of worms suffered the most.

Nearly all the fatal cases were due to this complication.

As noted in the report of the Assistant Medical Officer, South Mahé, cases of tuberculosis of the lungs are on the increase; it would appear that the greater number of individuals attacked by this disease belong to the Indian creoles, who come from Mauritius, and I am of opinion that the increase in the number of cases is chiefly due to the fact that the number of this class coming to and residing in Mahé is greater every year, and of course each case that occurs forms a fresh focus of infection; and thus it is to be feared that a disease which a few years ago was quite uncommon will become of greater frequency.

As in the past malarial fever originating in this colony is unknown; the only cases seen are individuals who come to the Island from other countries already infected, these cases invariably do remarkably well.

Without doubt the immunity from this disease is due to the absence of the Anopheles mosquito.

Intestinal parasites form the greatest menace to young life, if neglected; the variety of parasite is almost invariably the *Ascaris lumbricoides*, it may be said that scarcely any of the juvenile population are free from this scourge, and the careful mother recognising this, always as a routine administers a vermifuge to her children two or three times a year; in many cases, however, where this precaution is neglected, the child gets his intestinal tract practically full of these parasites; which fact naturally interferes considerably with the proper nourishment of the child; cases are often seen when the parasites are present in sufficient quantity to give rise to elongated palpable tumours in the child's abdomen, and in several instances I have met with cases of subacute intestinal obstruction due simply to this cause. But, as mentioned when speaking of the whooping cough epidemic, the most danger is caused when the worms act as a complication, or perhaps the cause, of a form of enteritis, which seems to follow the exanthematous diseases.

Sanitary Condition of the Town of Victoria.

The scavenging and night soil service have been performed in a manner distinctly more satisfactory than in former years.

The water supply was abundant all through the year, but owing to the fact that the water is taken directly out of a reservoir without having time to settle and to no system of filtration being used, the water, after heavy rains, is very highly coloured, and contains a very large amount of vegetable matter, which is washed into the rivers by the rains.

Report by J. E. Addison, Acting Chief Medical Officer.

Reports of the Assistant Medical Officers of South Mahé and Praslin districts are submitted herewith. Both reports point out the great improvement in the general health of their districts.

The death-rate of 11·06 for South Mahé is very low, being a decrease of 2·95 per thousand as compared with 1904.

Praslin has a death-rate of 13·77 per thousand, being less than the preceding year, which was 14·08 per thousand.

Vaccination.

Vaccination this year has given good results, viz.:—

	Victoria	South Mahé
Successful 1st time ...	332	138
,, 2nd ,, ...	70	17
,, 3rd ,, ...	13	—
Unsuccessful	28	—
	443	155

In August, 1905, compulsory re-vaccination was performed in the town of Victoria, as small-pox was very prevalent in the ports with which Mahé is in communication. Happily, the inhabitants of Seychelles have escaped infection.

Quarantine Services.

The quarantine station at Long Island was used during the earlier part of the year.

The station has a steam disinfector, which is always kept in good condition and ready for use at any moment.

The guardian continues to keep the property under his charge in a very satisfactory condition.

Hospitals and Dispensaries.

Annexure III. gives the monthly return of out-patients treated at the public dispensaries and number

of cases treated at the Victoria Hospital during the year 1905.

The number of patients treated at the public dispensaries has been higher than usual, this being entirely due to the prevailing poverty amongst the populace.

This institution received 332 patients for treatment during the year 1905, viz: 258 males and 74 females.

The number of deaths in hospital was 14; being 6 less than during 1904, and giving a death-rate of 42 per cent.

Annexure IV. gives the cases treated at the Victoria Hospital, and cause of death.

Dr. Robert Denman, the Chief Medical Officer, left the Colony on April 9th, 1905, on leave of absence, meanwhile Dr. Ande Gruchy acted as Chief Medical Officer.

ANNEXURE I.

Vital Statistics	Males	Females	Total
Estimated population on Dec. 31st, 1904 ...	10,500	9,918	20,418
Increase by births during 1905	352	328	680
	10,852	10,246	21,098
Arrivals during 1905 ...	171	88	259
	11,023	10,334	21,357
Decrease by deaths during 1905	168	138	306
	10,855	10,196	21,051
Decrease by departures during 1905	217	67	284
Estimated population on Dec. 31st, 1905 ...	10,638	10,129	20,767
Total births during 1905...	352	328	680
Total arrivals during 1905	171	88	259
	523	416	939
Total deaths during 1905	168	138	306
Total departures during 1905	217	67	284
Total decrease	385	205	590
Total increase as above ..	523	416	939
Total decrease as above ...	385	205	590

Vital Statistics	Males	Females	Total
Real increase	138	211	349
Births during 1905 ...	352	328	680
Deaths during 1905 ...	168	138	306
Excess of births over deaths	184	190	374
Departures in 1905 ...	217	67	284
Arrivals in 1905	171	88	259
Excess of departures over arrivals	+46	−21	+25
Excess of births over deaths	184	190	374
Excess of departures over deaths	+46	−21	+25
Total increase	138	211	349
Number of males on Dec. 31st, 1905 ...	10,638		
Number of females on Dec. 31st, 1905 ...	10,129		
Excess of males over females	509		
Number of males in 1905	10,638		
Number of males in 1904	10,500		
Increase	138		
Number of females in 1905		10,129	
Number of females in 1904		9,918	
Increase		211	

The population has increased by 349; the males by 138, and the females by 211. The increase of females in 1905 exceeded by 73 the increase of males.

AGES AT WHICH DEATH HAS OCCURRED.

Under 1 year		1 to 5 years		5 to 70 years		70 to 100 years		Total	
M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
45	40	21	20	80	64	22	14	168	138
85		41		144		36		306	

Still births, 33 males and 21 females. Total 54.
There were 7 twin births during the year.

ANNEXURE II.

RESULT OF CASES TREATED AT THE VICTORIA HOSPITAL.

Sexes	Remaining in Hospital at the end of 1904.	Admitted during 1905.	Total treated	Cured	Relieved	Unrelieved	Died	Remaining at the end of 1905	Total
Males	6	252	258	194	33	11	11	10	258
Females	3	71	74	47	12	9	3	2	74
Total	9	323	332	241	45	20	14	12	332

METEOROLOGICAL RETURN.

Months	Barometer	Solar Maximum	Minimum on Grass	Shade Maximum	Shade Minimum	Range	Mean	Amount in Inches	Depth of Humidity	Direction of wind	Average Force	Deaths per month	Remarks
January ..	30·07	161·	72·8	83·1	76·8	6·3	80·	13·40	3·05	N.W.	6·1	41	
February ..	30·07	160·	73·2	83·5	77·0	6·5	80·9	6·03	5·22	N.W.	6·5	27	*S.E. winds from May 15th, 1905. †.. Instrument broken —no record. ‡N.W. from Dec. 3rd, 1905.
March ..	30·05	163·	74·2	83·7	79·4	4·3	82·0	3·47	6·50	N.	5·7	23	
April ..	30·07	162·	72·3	86·0	78·6	7·4	79·5	4·22	8·35	N.W.	5·1	32	
May ..	30·07	160·9	72·6	85·1	78·7	6·4	80·4	9·54	5·75	N.W. *S.E.	7·2	34	
June ..	30·10	148·	71·6	82 1	77·0	5·1	79·5	0·89	11·99	S.E.	11·3	28	
July ..	30·11	157·	70·2	81·6	76·9	4·7	78·9	0·62	6·17	S.E.	10·6	14	
August ..	30·08	150 2	72·	81·3	76·4	4·9	78·8	6·25	7·39	S.E.	12·3	18	
September	30·08	155·	69·8	82·1	76·1	6·0	79·1	12·92	4·07	S.E.	11·1	16	
October ..	30 07	158·8	70·1	83·4	76·7	6·7	79·9	0.48	5·63	S.E.	8·3	29	
November	30·08	† ..	71·6	84·5	77·0	7·5	79·0	5·58	5·29	E. & calm	5·4	15	
December	30·03	† ..	71·6	83·	77·3	6·7	80·1	25 51	3·96	‡N.W.	7·4	29	

RETURN OF OUT-PATIENTS TREATED AT THE PUBLIC DISPENSARIES.

Month	Victoria Hospital		Anse Royale		Anse Boileau		Praslin		Total
	M.	F.	M.	F.	M.	F.	M.	F.	M. and F.
January	53	151	31	11	5	7	49	16	323
February	66	199	19	15	3	5	44	8	359
March	77	285	23	13	3	5	28	20	454
April	63	246	25	15	3	3	24	15	394
May..	52	217	32	16	3	4	30	21	375
June	33	182	30	20	1	10	31	15	322
July..	36	219	27	17	2	5	24	22	352
August	50	172	24	23	2	7	24	18	320
September..	79	153	25	22	5	6	17	16	323
October	53	223	20	18	3	6	17	34	374
November	73	213	20	19	1	8	18	17	369
December	69	197	21	18	2	5	17	10	339
Total	704	2,457	297	207	33	71	323	212	4,304

Report of First and Second Divisions South Mahé. By John Thos. Bradley, Assistant Medical Officer, Anse Royale.

PART I.

The health of the district continued good until the end of November. At the end of that month whooping-cough entered the district, although no deaths from this disease occurred up to the end of the year, yet I am of opinion that as the disease progresses its virulence will increase, and it will result in the weeding out of weak and debilitated children.

In former reports I drew attention to the fact that tubercular disease was not to be found in South Mahé. It is with regret that I note for the past two years that this cruel disease is making progress. Slowly but surely the insidious approach can be observed, and in future years tuberculosis will have to be reckoned as one of the diseases that active and prompt steps will have to be taken against.

Phthisis is at present occupying world-wide attention; scientific societies all over the world occupy themselves with its causation and treatment. At times it is suddenly reported that a remedy to combat the disease has been discovered, and after a more or less extensive trial the remedy is abandoned, and so year after year we get reports of wonderful remedies, and after a time it is found that the new remedies are no improvement on the old. When a disease is complimented by having so much attention paid to it there is no doubt that its ravages and the death-roll caused by it must be considerable, and I consider that tubercular disease, under all its different forms and manifestations, is one of the greatest scourges of the human race. Taken as a fact that the disease has invaded Seychelles, the people should be educated up to the disease; they should have explained to them what science has done and is doing to stay and arrest its progress, and unless a correct view is brought home to the people the arrest of such an insidious disease is almost impossible.

Return of Diseases and Deaths of Europeans in 1905 throughout the Seychelles.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	5	1	5
Anæmia	9	—	9
Anthrax	—	—	—
Beri-beri	—	—	—
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	—	—	—
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Congenital Malformation	—	—	—
Debility	5	—	5
Delirium Tremens	—	—	—
Dengue	—	—	—
Diabetes Mellitus	—	—	—
Diabetes Insipidus	—	—	—
Diphtheria	—	—	—
Dysentery	—	—	—
Enteric Fever	—	—	—
Erysipelas	—	—	—
Febricula	—	—	—
Filariasis	—	—	—
Gonorrhœa	—	—	—
Gout	—	—	—
Hydrophobia	—	—	—
Influenza	—	—	—
Kala-Azar	—	—	—
Leprosy	—	—	—
(*a*) Nodular	—	—	—
(*b*) Anæsthetic	—	—	—
(*c*) Mixed	—	—	—
Malarial Fever—	1	—	1
(*a*) Intermittent	—	—	—
Quotidian	—	—	—
Tertian	—	—	—
Quartan	—	—	—
Irregular	—	—	—
Type undiagnosed	—	—	—
(*b*) Remittent	—	—	—
(*c*) Pernicious	—	—	—
(*d*) Malarial Cachexia	—	—	—
Malta Fever	—	—	—
Measles	—	—	—
Mumps	—	—	—
New Growths—	—	—	—
Non-malignant	—	—	—
Malignant	—	—	—
Old Age	5	3	5
Other Diseases	62	2	62
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	—	—	—
Rachitis	—	—	—
Rheumatic Fever	—	—	—
Rheumatism	8	—	8
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	—	—	—
Septicæmia	1	—	1
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox	—	—	—
Syphilis	10	—	10
(*a*) Primary	—	—	—
(*b*) Secondary	—	—	—
(*c*) Tertiary	—	—	—
(*d*) Congenital	—	—	—
Tetanus	1	—	1
Trypanosoma Fever	—	—	—
Tubercle—	—	—	—
(*a*) Phthisis Pulmonalis	—	—	—
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculous Disease of Bones	2	—	2
General Diseases—*continued.*			
Other Tubercular Diseases	—	—	—
Varicella	—	—	—
Whooping Cough	—	—	—
Yaws	—	—	—
Yellow Fever	—	—	—

LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	—	—	—
Circulatory System—	—	—	—
(*a*) Valvular Disease of Heart	—	—	—
(*b*) Other Diseases	7	2	7
Digestive System—	—	—	—
(*a*) Diarrhœa	4	—	4
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	6	—	6
Congestion of the Liver	—	—	—
(*d*) Abscess of Liver	—	—	—
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	—	—	—
(*g*) Cirrhosis of Liver	—	—	—
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	50	1	50
Ear	—	—	—
Eye	9	—	9
Generative System—	35	—	35
Male Organs	—	—	—
Female Organs	—	—	—
Lymphatic System	—	—	—
Nervous System	19	2	19
Nose	—	—	—
Organs of Locomotion	—	—	—
Respiratory System	16	1	16
Skin—	—	—	—
(*a*) Scabies	—	—	—
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	—	—	—
(*f*) Other Diseases	—	—	—
Urinary System	5	1	5
Injuries, General, Local—	—	—	—
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	—	—	—
Parasites—	—	—	—
Ascaris lumbricoides	—	—	—
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	—	—	—
Tape-worm	—	—	—
Poisons—			
Snake-bites	—	—	—
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	—	—	—
Surgical Operations—			
Amputations, Major	—	—	—
,, Minor	—	—	—
Other Operations	—	—	—
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

Colonial Medical Reports.—No. 30.—Seychelles (*continued*).

FIFTY years ago the treatment was one of hot and confined rooms, all sources of air being carefully excluded, and the patient was kept like a hot-house plant. To-day the pendulum has gone to the opposite extreme: Fresh air and plenty of it, is the cry, and instead of keeping patients confined to close and stuffy chambers, their treatment is what is called the out-door and sanatorium. This wonderful change in treatment is sanctioned not only on scientific grounds, but on the splendid results now being published of the diminution in the death-rate where open-air treatment is carried out, and these results compared with those obtained under the old *régime*.

The question now at issue is, Can an open-air treatment be carried out with successful results at Seychelles? There are a great many people at Seychelles—in fact, the bulk of the population—who, for lack of means, are unable to take a voyage to South Africa, Algeria, or any of the usual health resorts which are laid down as suitable for individuals suffering from consumption. Under these circumstances the disease has to be combated at home, and I am of opinion that success in the treatment of phthisis can be obtained here, if the disease is taken in time and before it has obtained too firm a grip on the individual.

The question is, what is an ideal climate for tuberculous patients, and how can Seychelles be looked at from this point of view. I hold that the question of climate is less significant than that of *régime*, and it is to the advantage of the great majority of patients to be treated under the normal climatic condition of the individual.

An ideal climate for tuberculous patients is one having a pure and dry air which is frequently in mild movement, a maximum of sunlight, relatively equable temperature and warmth, freedom from dust, a certain amount of shelter, combined with a picturesque landscape and extreme stillness; this would be an ideal climate, in my opinion, but I do not know any country that fills exactly the conditions.

Varieties of climate for tubercular patients may be grouped thus:—

(1) Sea-coast climates.

(2) Desert climates.

(3) Forest and woodland climates of relatively small elevation (say 150 to 1,500 feet).

(4) Mountain climates (say 1,500 to 10,000 feet or more).

Seychelles is a sea-coast climate, is has the advantages of a pure air, no extreme ranges of temperature; it has the disadvantage of being too humid, and is often relaxing and enervating. I would not recommend an individual to seek Seychelles as a health resort, but I am strongly of opinion that cases of phthisis can be combated with here, as well as in a good many parts of Great Britain and Ireland The French and Italian Riviera, Madeira, &c., are all sea-coast climates, and are all used as health resorts for consumptive individuals; in late years I understand that the Madeira Islands are not so much used, owing to the depressing and weakening influence on consumptive people. Yet the great question is to cure the patient, and to undertake the cure (other things being equal) under the conditions which he must meet when recovery has taken place, and this is the issue that has to be faced by the inhabitants of Seychelles.

To sum up, the modern treatment of the disease should be combated in Seychelles on the following lines:—

(1) Improve the resistance of the individual to the disease.

(2) Take measures to attack, or at least neutralise, the products resulting from the growth and development of the tubercle bacillus within the body.

(3) Relieve the more important symptoms and complaints.

(4) Prevent the progress and advance of the disease in the community.

The improvement under (1) can be carried out on the lines that are followed by the principal sanatoria of the world, viz., fresh air and sunlight, rest, graduated and progressive exercise, dietary, skin hygiene, and medication; (2) and (3) are in the domain of the physician, who should take advantage of the latest discoveries; (4), which is probably the most important, should be met with by educating the public to the disease, by a system of segregation, and the establishment of a sanatorium in which all patients who were attacked by the disease would be compelled to reside.

Referring to pneumonia: during the year five deaths occurred; the mortality rate of this disease increases as you approach the Tropics, and from an examination of statistics of different countries I find that this is borne out.

There is an epidemic of whooping cough amongst the children, and I find that vaccination not only modifies the course of the disease, but in some cases is curative in its effects. I find that children, after vaccination, get a very mild form of the disease, that the spasms are absent, and the vomiting and other disagreeable symptoms do not make their appearance.

The mortality of children under one year is 16; a good number of the children only survive birth an hour or so, and some die within the first week of birth; all the same, more than one-fourth of the deaths that occur can be placed under the first year of life.

PART II.

VITAL STATISTICS.

As in former years, further on I have attached tables, showing a comparison of the births, deaths, and still-births of the years 1902 to 1905, also comparative tables of the ages at which death occurred during these years.

In my report of last year I tried to show what is the danger zone, &c., in the life of the inhabitants of Seychelles, and also the period more favourable to life. The most favourable period is probably between the ages of 30 and 45, and the dangerous zones the first year of life and after 55.

There is practically no increase in the mortality of children under 5 years, but in the year 1906 I am afraid the epidemic of whooping cough will have a marked increase on the death-rate under 5 years. In 1902 the number of deaths of children under 5 years

was 28, in 1903 it was 21, in 1904 it was 17, and in 1905 it was 20; so that practically for three years the death-rate has not changed.

Taking the births as 166 for the year 1905 and the deaths as 51, the increase in population for the year 1905 is 115; this increase, added to the increases of 1902, 1903, and 1904, makes a net increase of 408 for these four years.

1901	(Census taken in that year), population...	4,203
1902	Estimated population to December 31st	4,301
1903	,, ,, ,, ,,	4,404
1904	,, ,, ,, ,,	4,496
1905	,, ,, ,, ,,	4,611

The number of deaths for the year in South Mahé was 51, a diminution of 12 as compared with the year 1904. I think this is below the average; anyway, it is a small average for the year. As usual, a good number of old people died during the year. There were 7 deaths over 50 and under 60 years; 10 under 80 years; 1 under 90 years, and 1 over 90 years.

Taking the estimated population as 4,611, this works out a death-rate of 11·06 per thousand, being a diminution of 2·95 per thousand as compared with 1904.

The principal diseases that caused death during 1905 as as follows: Senile decay, 10; gastritis, 8; pneumonia, 5; hemiplegia, 2; endocarditis, 2; aneurism of aorta, 2; Bright's disease, 2.

During the year 1905 there were only 4 still-births, for the past three years the number was 11 each year.

During the year 1905 there were 166 births, an increase of 11 as compared with 1904.

The average birth-rate per thousand for 1905 is 36·00, being an increase of 1·53 per thousand as compared with the preceding year.

Part III.

Dispensaries of Anse Royale and Anse Boileau.

The dispensary of Anse Royale was well attended during the year on Mondays, Wednesdays, and Fridays, by the poor. During the year there were 504 consultations, being an increase on the year 1904 of 104 patients.

The dispensary was held at Anse Boileau every Thursday morning. The number of consultations for the year was 104.

As in former years, I have attached tables showing the diseases treated at the dispensaries and the number of consultations under each disease.

Vaccination.

The vaccine lymph supplied was excellent, and reflects credit on the preparation and maker; even after five and six weeks it still had its vitality. There was a small-pox scare during the year, and an extra supply of vaccine was supplied, some of it came from Madagascar, and the quality from this source was not good—after two weeks it was useless; the extra supply that came afterwards was excellent.

During the year I vaccinated all Government employees in South Mahé, including the cantoneers; the bulk of the school children attending at Anse Royale were also vaccinated. Of the general public, about 300 adults came to me for the free vaccination. In almost all cases the vaccination was successful, but some of the adults got marked swelling of the arms and glands in the axilla, accompanied by a severe reaction.

During the year I vaccinated 155 children; all the cases were successful; 138 at the first attempt, 17 at the second.

Part IV.

Surgeon's Work in Police Cases.

During the year there were 32 police cases at Anse Royale of wounds and blows, and 1 at Anse Boileau. Most of the cases were of a trivial nature, none of them were dangerous to life.

Accompanied by the police I examined and enquired into two deaths in my district, and one just outside the limits of the ninth mile at Anse Boileau. The first of these cases occurred on January 22nd, 1905. Accompanied by Sub-Inspector Tonnet, I went to Grand Police, and after examination of the body I found that death was due to drowning; evidence brought forward showed that it was accidental. The next case occurred on December 25th, 1905, at Anse Boileau; the man in this case had committed suicide in his bath-room. The case outside my district was that of an old man, aged about 80, who, one Sunday afternoon, cut short his life by hanging himself in his bedroom. Hanging is the method preferred by the natives when they wish to commit suicide.

Comparative Table of Births, Deaths and Still-births during the Years 1902, 1903, 1904 and 1905.

Years	Births	Deaths	Still-births	Remarks
1902	157	59	11	Births in 1903 exceeded that of 1902 by 12; there is a dimunition of 14 in the year 1904 compared with 1903; in 1905 the births exceed those of 1904 by 11.
1903	169	66	11	
1904	155	63	11	The year 1905 is the lowest death-rate in South Mahé for the past four years. The still-births have fallen in 1905 to 4.
1905	166	51	4	

Births, Deaths, Still-births and Marriages, 1902 to 1905.

Years	Births per 1,000	Deaths per 1,000	Still-births per 1,000	Marriages per 1,000	Remarks
1902	36·50	13·71	2·55	5·34	23 marriages in 1902
1903	38·37	14·98	2·49	6·58	29 ,, ,, 1903
1904	34·47	14·01	2·44	6·22	28 ,, ,, 1904
1905	36·00	11·06	·86	4·51	21 ,, ,, 1905

COMPARATIVE TABLES OF THE PRINCIPAL DISEASES CAUSING DEATH IN SOUTH MAHÉ DURING THE YEARS 1902, 1903, 1904 AND 1905.

Diseases	Year 1902											Year 1903										Year 1904										Year 1905									
	Under 1 year	Under 5 years	Under 20 years	Under 30 years	Under 40 years	Under 50 years	Under 60 years	Under 80 years	Under 90 years	Over 90 years	Total 1902	Under 1 year	Under 5 years	Under 20 years	Under 30 years	Under 40 years	Under 50 years	Under 60 years	Under 80 years	Under 90 years	Over 90 years	Total 1903	Under 1 year	Under 5 years	Under 20 years	Under 30 years	Under 40 years	Under 50 years	Under 60 years	Under 80 years	Under 90 years	Over 90 years	Total 1904	Under 1 year	Under 5 years	Under 20 years	Under 30 years	Under 40 years	Under 50 years	Under 60 years	Under 80 years	Under 90 years	Over 90 years	Total 1905
Apoplexy	..	..	..	..	..	..	..	..	..	..	—	..	..	..	..	..	..	..	..	..	..	—	..	..	..	..	..	..	..	2	..	..	2	..	..	..	..	..	..	..	..	..	..	—
Asthma	..	1	2	..	1	..	..	..	..	..	4	..	..	..	..	..	..	..	..	..	..	—	..	..	..	..	..	..	..	..	..	..	—	..	..	..	..	..	..	..	..	..	..	—
Accidents, &c.	..	..	..	..	2	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	—	..	..	..	..	..	..	..	..	..	..	—	..	..	..	..	1	..	..	..	..	..	1
Aneurism	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	—	..	..	..	..	..	..	..	..	..	..	—	..	..	..	..	..	..	..	1	..	..	2
Cancer	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	—	..	..	..	..	..	..	..	..	..	..	—	..	..	..	..	..	..	..	..	..	..	—
Cardiac Disease	..	..	..	..	..	..	1	..	..	..	1	..	2	1	..	1	1	1	2	..	..	8	1	..	1	..	1	..	1	..	..	..	4	..	..	..	..	..	..	2	..	..	..	2
Dysentery	..	1	2	..	..	..	..	..	..	..	3	..	3	2	..	..	..	1	..	..	..	6	1	2	..	..	..	..	..	2	..	..	5	..	1	..	..	..	..	..	..	..	..	1
Elephantiasis	..	..	..	..	..	..	..	..	..	..	—	..	..	..	..	..	..	1	1	..	..	2	..	..	..	..	..	..	..	..	..	..	—	..	..	..	..	..	..	..	..	..	..	—
Gastritis	..	2	..	..	..	..	..	..	..	..	2	6	1	..	..	..	..	1	..	..	..	8	1	..	..	..	..	..	..	..	..	..	1	7	1	..	..	..	..	..	..	..	..	8
Gangrene	..	..	..	..	..	..	..	..	..	..	—	..	..	..	1	..	..	..	1	..	..	2	..	..	..	..	2	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	—
Hernia	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	—	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	—
Hemiplegia	..	..	..	..	..	1	1	..	2	..	4	..	..	..	..	..	..	..	2	..	1	3	..	..	..	..	..	1	1	..	..	..	2	..	..	..	..	..	..	1	1	..	..	2
Leprosy	..	..	..	..	1	..	1	..	..	..	2	..	..	..	..	..	..	..	..	..	..	—	..	..	..	..	..	..	2	..	..	..	2	..	..	..	..	..	..	..	..	..	..	—
Peritonitis	..	..	2	..	..	..	..	1	..	..	3	..	..	..	..	..	..	..	..	..	..	—	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	—
Pleurisy	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	—	..	..	..	..	..	..	..	..	..	..	—	..	..	..	..	..	..	..	..	..	..	—
Pneumonia	..	1	..	1	1	1	2	..	..	..	7	..	2	3	3	..	..	..	..	..	..	8	..	..	..	..	..	1	2	1	..	..	4	1	..	1	1	2	..	..	..	..	..	5
Senile Decay	..	..	..	..	..	..	..	1	1	..	2	..	..	..	..	..	..	..	3	..	3	6	..	..	..	..	..	..	1	7	3	5	16	..	..	..	..	..	..	8	1	1	10
Urethral Disease	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	—	..	..	..	..	..	..	..	..	..	..	—	..	..	..	..	..	..	..	..	..	..	—
Syphilis	..	..	..	..	..	1	..	..	..	..	1	..	1	..	..	1	1	..	..	..	..	3	2	2	1	1	..	..	1	2	..	..	9	1	..	..	1	..	..	..	..	..	..	2

TABLE OF DISEASES CAUSING DEATH IN SOUTH MAHÉ FIRST AND SECOND DIVISIONS DURING 1905.

Causes of Death	Under 1 year	Under 5 years	Under 20 years	Under 30 years	Under 40 years	Under 50 years	Under 60 years	Under 80 years	Under 90 years	Over 90 years	Total
Abscess of the Liver	..	..	..	..	..	..	1	..	..	..	1
Anæmia	..	1	..	..	..	..	..	..	..	..	1
Aneurism of Aorta	..	..	..	..	1	..	..	1	..	..	2
Bright's Disease	..	..	1	..	..	..	1	..	..	..	2
Drowning	..	..	1*	..	..	..	..	..	..	..	1
Dysentery	..	1	..	..	..	..	..	..	..	..	1
Endocarditis	..	..	..	..	..	..	2	..	..	..	2
Gastritis	7	1	..	..	..	..	..	..	..	..	8
Hemiplegia	..	..	..	..	..	..	1	1	..	..	2
Influenza	..	..	..	..	..	..	1	..	..	..	1
Phthisis, Pulmonary	..	..	..	1	..	..	..	..	..	..	1
Pneumonia	1	..	1	1	2	..	..	..	..	..	5
Syphilis, Hereditary	1	..	..	..	..	..	..	..	..	..	1
Syphilis	..	..	..	1	..	..	..	..	..	..	1
Senile Decay	..	..	..	..	..	..	..	8	1	1	10
Strangulation	..	..	..	..	..	..	1†	..	..	..	1
Tetanus	..	..	..	..	1	..	..	..	..	..	1

UNCLASSIFIED CAUSE GIVEN BY RELATIVES.

Disease of the Stomach	..	..	..	..	1	..	..	..	..	..	1
Exhaustion	..	6‡	..	..	..	..	..	..	..	..	6
Colic	..	..	..	1	..	..	..	..	..	..	1
Fever	..	..	1	..	..	..	..	..	..	..	1
Infantile Disease	1	..	..	..	..	..	..	..	..	..	1
	16	4	4	5	3	..	7	10	1	1	51

* A complete enquiry was made; cause of death accidental.

† Suicide.

‡ A good number of these children died a few hours after birth.

COMPARATIVE TABLE OF THE AGES AT WHICH DEATH OCCURRED DURING THE YEARS 1902, 1903, 1904 AND 1905.

Deaths during the year	Under 1 year	Under 5 years	Under 20 years	Under 30 years	Under 40 years	Under 50 years	Under 60 years	Under 80 years	Under 90 years	Over 90 years	Total
1902	16	12	1	9	5	7	4	2	3	—	59
1903	10	11	10	8	4	5	5	9	—	4	66
1904	12	5	4	4	1	4	9	16	3	5	63
1905	16	4	4	5	3	—	7	10	1	1	51

The following were the complaints treated at Anse Royale and Anse Boileau Dispensaries :—

Disease.	Anse Royale. Number of Consultations.	Anse Boileau. Number of Consultations.
Anæmia	41	12
,, Pernicious	4	—
Asthmatic Bronchitis	1	—
Ankylostomiasis	6	—
Amenorrhœa	2	—
Abscess of Knee-joint	10	—
,, Axilla	1	—
Bronchitis, Acute	12	3
,, Chronic	3	1
Bright's Disease	1	—
Constipation	14	3
Colitis	8	—
Colic	8	4
Climacteric	1	—
Conjunctivitis	3	—
Cystitis	3	—
Diarrhœa	4	3
Dysentery	21	3
Dental Abscess	1	—
Dysmenorrhœa	1	2
Debility	65	25

Disease.	Anse Royale. Number of Consultations.	Anse Boileau. Number of Consultations.
Doubtful	—	1
Endocarditis	10	—
Elephantiasis	1	4
Fibroid of Uterus	13	2
Fracture of Arm	—	2
Gastritis	17	4
Glossitis	1	—
Gonorrhœa	24	7
,, Warts	1	—
,, Bubo	2	—
Goitre	7	—
Hæmorrhoids	11	1
Hernia	11	1
Hysteria	17	2
Hepatitis	3	—
Hydrocele	7	1
Injury to Foot	4	—
Injury to Left Side	1	—
Inflammation of Cord	3	—
Indigestion	9	2
Influenza	1	1
Leprosy	4	4
Lumbago	2	—
Mastitis	2	—
Migraine	3	1
New Growths	11	—
Osteitis	13	—
Otorrhœa	3	—
Ovaritis	4	—
Pregnancy	6	—
Pertussis *	14	—
Phthisis	32	1
Pleurisy	—	1
Rheumatism †	18	2
,, Muscular	2	—
Syphilis	17	—
,, Hereditary	1	—
,, Tertiary	5	1
Synovitis	4	—
Torticollis	—	3
Tonsillitis	4	—
Ulcers, Tropical	4	—
,, Syphilitic	2	—
,, Varicose	1	—
,, of Cornea	4	—
Wounds of Arm	2	—
,, Leg	3	—
,, Heel	2	—
,, Finger	1	—
Worms (*Ascaris lumbricoides*)	12	8

* Whooping cough declared in the commencement of December.
† A good many of the cases were of a gonorrhœal nature.

PRASLIN DISTRICT.

Medical Report for the Year 1905. *By Dr. R. Laidlaw, A.M.O.*

THE inhabitants of the Praslin District have again enjoyed, during 1905, a twelvemonth of comparative freedom from sickness and disease, accompanied, as is usual, by a low death-rate and a high birth-rate.

Some particular features of the health of the district and its medical institutions require special notice.

ROUND ISLAND ASYLUM.

In the Leper Home and Pauper Camp, located on Round Island, the population at the beginning of the year was composed of 9 lepers and 10 paupers, and at the end of the year it was composed of 11 lepers and 15 paupers. That is, the diminished income of the labouring class, through lessened employment, has caused an increased demand for Government help in the case of the incapable and the infirm. Throughout the year all the inmates have shown a spirit of contentment and gratitude. Although their daily life is limited and monotonous in its interests, they have not been unhappy, or only when disease was acute. Basket-making, poultry-keeping, and rock-fishing are pursued by several in a fitful fashion, and they are the most cheerful of all. The majority prefer to sit idle in the sun, and do nothing but talk and smoke, and so proclaim practically their belief that idleness is happiness!

DISTRICT DISPENSARIES.

The two dispensaries at St. Anne and Grand Ance, Praslin, and the third at Ladigue have continued free medical help to the more destitute sick. This help, as formerly, has been much appreciated, and now and then, where benefit received was marked, has been very warmly acknowledged.

The number treated during the year has been: 323 new and 212 old cases, as against 243 new and 165 old the year before.

In an appendix the more frequently occurring ailments are enumerated. Of these, the debilitating diseases dependent on or associated with anæmia are the most important, and the most difficult to remedy. More than one generation, in not a few cases, have clearly contributed to the cachectic state and its concomitants. So, prolonged dietetic treatment is indicated as much as ordinary medical treatment.

PARASITIC DISEASES.

The chief parasitic disease is the round-worm, and few young people, if any, are exempt from its attack. Recently, one vermifuge dose administered to a child of six caused the evacuation of above 100 worms! The more formidable tape-worm is rare. We met with one case only in the course of the year.

Tineas of the scalp and skin are not uncommon; they are chiefly found in the case of those who notoriously neglect personal cleanliness. A widespread notion prevails, even amongst the better educated, that a scalp eruption should not be washed. Hence the unsightly heads of many otherwise healthy children.

EPIDEMIC DISEASE.

The district has throughout the year been entirely exempt from epidemic forms of trouble, except influenza colds and sporadic chicken-pox, and the last has been limited in extent, and not dangerous in type.

LEPROSY.

Leprosy is not increasing. An enquiry has been made regarding the possibility of procuring and using in Seychelles the specific remedy associated with the name of Captain Rost, of the I.M.S., which he had termed "leprolin." The announcements of its efficacy, however, seem to have been premature, and it is not as yet available. There is no doubt, however, but that a serum remedy of that special type will ere long be in effective use.

Colonial Medical Reports.—No. 30.—Seychelles (*continued*).

Wounds and Fractures.

The accidents arising from edged tools still abound, while dislocation and fracture occur occasionally. The gross neglect of surgical instructions, and the attempts to try if something else will not hasten the cure, make one desire a local hospital on a small scale, to control and maintain, for the necessary time, the surgical appliances.

Vaccination Results.

The vaccine lymph has given good results on the whole, as far as concerns that received from England. The lymph received from Madagascar, in the sudden precautionary measures against a possible invasion of small-pox, did not seem in the district to give results as favourably.

Birth and Death-rates.

The considerable number of 119 births were registered during the year. A large proportion of these are children born out of wedlock. Of the 119 the legitimate were 72 in number, and the illegitimate 47.

Forty-two deaths were registered throughout the year, and of these ten were the deaths of infants under one year, occurring very much, it is to be feared, from maternal ignorance or lack of sufficient care.

The estimated population of the district on January 1st, 1905, was 3,049, and the deaths being 42, gives a death-rate of 13·77 per thousand of the population. The year immediately preceding this figure was slightly higher, viz., 14·08.

APPENDIX.

The more Common Dispensary Diseases.

Abscess.
Amenorrhœa.
Amputation.
Anal fissure.
Anæmia.
Anorexia.
Antrum abscess.
Asthma.
Ascites.
Blenorrhagia.
Bronchitis.
Bubo.
Cardiac palpitation.
Cardiac valvular disease.
Cataract.
Cephalalgia.
Cerebritis.
Colic.
Congestio enteri.
Conjunctivitis.
Coryza.
Constipation.
Cystitis.
Diarrhœa.
Dropsy.
Dysentery.
Dysmenorrhœa.
Dyspepsia.
Eczema.
Enteritis.
Epididymitis.
Epilepsy.
Fever.
Fibroids.
Fracture.
Hemiplegia.
Hepatitis.
Herpes zoster.
Hæmorrhoids.
Hydrocele.
Hysteria.
Insanity.
Intracapsular fracture of neck of femur.
Ichthyosis.
Influenza.
Kidney rupture.
Laryngitis.
Leprosy.
Leucorrhœa.
Locomotor ataxia.
Lumbago.
Nasal polypus.
Necrosis.
Nephritis.
Neuralgia.
Ophthalmia neonatorum.
Orchitis.
Otorrhœa.
Ovaritis.
Paralysis agitans
Periostitis.
Perihepatitis.
Perineal abscess.
Polyuria.
Prostatitis.
Polypus.
Psoriasis.
Pulmonary congestion.
Retinitis.
Rheumatism.
Sciatica.
Spinal meningitis.
Sprain.
Stomatitis.
Syncope.
Syphilis.
Synovitis.
Tænia favoaca.
Tænia tonsurans
Thrush.
Tic douloureux.
Tonsillitis.
Toothache.
Torticollis.
Ulcers.
Urticaria.
Varicella.
Warts.
Whitlow.
Worms.
Wounds.

Colonial Medical Reports.—No. 31.—British Guiana.

MEDICAL REPORT FOR THE YEAR 1905.

By J. E. GODFREY.

Surgeon-General.

RETURN OF THE STATISTICS OF POPULATION FOR THE YEAR 1905.

	Europeans and Whites	Africans	East Indians	Chinese	Mixed	Native Blacks	Aborigines	Total
Number of Inhabitants in 1904 ..	15,698	1,718	125,896	2,533	33,833	115,444	6,801	301,923
,, Births during the year 1905	377	..	4,093	75	1,202	4,069	378	10,194
,, Deaths ,, ,, ,,	453	109	3,239	89	679	3,391	354	8,314
,, Immigrants ,, ,,	..	..	2,218	131	..	..	..	2,349
,, Emigrants ,, ,,	..	..	2,561	201	..	..	..	2,762
Number of Inhabitants in 1905 ..	15,622	1,609	126,407	2,449	34,356	116,122	6,825	303,390
Increase	..	..	511	..	523	678	24	1,464
Decrease	76	109	..	84	..	..	..	..

POPULATION.

Estimated population (1905), 303,390; births (1905), 10,194; deaths (1905), 8,314; birth-rate per 1,000 (1905), 33·6, (1904) 30·3; death-rate per 1,000 (1905), 27·4, (1904) 28·8.

MORTALITIES.

The relative mortalities in the different quarters were: March quarter, 2,172; June quarter, 1,808; September quarter, 2,161; December quarter, 2,173.

MALARIAL FEVERS.

These showed the highest number of deaths, and were again highest in the September quarter, the June quarter also again showed the lowest number, and the December quarter the next highest number of deaths.

DIARRHŒAL DISEASES.

These showed the next highest number of deaths, the March quarter being responsible for the largest number of cases and the December quarter for the smallest. The June quarter was lower than the September.

BRONCHITIS AND PNEUMONIA.

These diseases were again principally confined to the East Indian race. The totals for the third and last quarters were about the same, and were higher than the first and second quarters, which were about equal.

PHTHISIS AND OTHER FORMS OF TUBERCULOSIS.

These were highest in the December quarter, but there was very little difference between that quarter and the first. The second and third quarters were about the same.

KIDNEY DISEASES.

The deaths from these diseases were highest in the December quarter, the March and September quarters were about the same and were higher than the June quarter.

There were a few sporadic cases of beri-beri, typhoid or enteric and blackwater fevers, but I am again glad to report that the deaths from these diseases were very few.

None of these diseases appeared in an epidemic form.

RETURN OF DISEASES AND DEATHS IN 1905 AT THE FOLLOWING INSTITUTIONS:—

Georgetown Hospital, Berbice Hospital, Suddie Hospitals, Bartica Hospital, Morawhanna Hospitals, including Arakaka Ward.

GENERAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Alcoholism	18	1	18
Anæmia	272	8	272
Anthrax	1	—	1
Beri-beri	1	—	1
Bilharziosis	—	—	—
Blackwater Fever	—	—	—
Chicken-pox	8	—	8
Cholera	—	—	—
Choleraic Diarrhœa	—	—	—
Congenital Malformation	—	—	—
Debility	103	10	103
Delirium Tremens	—	—	—
Dengue	—	—	—
Diabetes Mellitus	4	—	4
Diabetes Insipidus	—	—	—
Diphtheria	—	—	—
Dysentery	294	93	294
Enteric Fever	—	—	—
Erysipelas	14	2	14
Febricula	71	—	71
Filariasis	—	—	—
Gonorrhœa	231	—	231
Gout	—	—	—
Hydrophobia	—	—	—
Influenza	8	—	8
Kala-Azar	—	—	—
Leprosy	—	—	—
(*a*) Nodular	—	—	—
(*b*) Anæsthetic	60	1	60
(*c*) Mixed	24	4	24
Malarial Fever—	52	34	52
(*a*) Intermittent	1,911	53	1,911
Quotidian	—	—	—
Tertian	—	—	—
Quartan	—	—	—
Irregular	—	—	—
Type undiagnosed	—	—	—
(*b*) Remittent	87	10	87
(*c*) Pernicious	27	22	27
(*d*) Malarial Cachexia	63	1	63
Malta Fever	—	—	—
Measles	52	1	52
Mumps	—	—	—
New Growths—	—	—	—
Non-malignant	37	—	37
Malignant	61	24	61
Old Age	59	13	59
Other Diseases	—	—	—
Pellagra	—	—	—
Plague	—	—	—
Pyæmia	1	—	1
Rachitis	—	—	—
Rheumatic Fever	—	—	—
Rheumatism	338	1	338
Rheumatoid Arthritis	—	—	—
Scarlet Fever	—	—	—
Scurvy	—	—	—
Septicæmia	54	44	54
Sleeping Sickness	—	—	—
Sloughing Phagedæna	—	—	—
Small-pox	—	—	—
Syphilis	—	—	—
(*a*) Primary	23	—	23
(*b*) Secondary	221	27	221
(*c*) Tertiary			
(*d*) Congenital	14	6	14
Tetanus	28	20	28
Trypanosoma Fever	—	—	—
Tubercle—	54	16	54
(*a*) Phthisis Pulmonalis	—	—	—
(*b*) Tuberculosis of Glands	—	—	—
(*c*) Lupus	—	—	—
(*d*) Tabes Mesenterica	—	—	—
(*e*) Tuberculous Disease of Bones	—	—	—
GENERAL DISEASES—*continued.*			
Other Tubercular Diseases	—	—	—
Varicella	—	—	—
Whooping Cough	1	—	1
Yaws	17	—	17
Yellow Fever	—	—	—

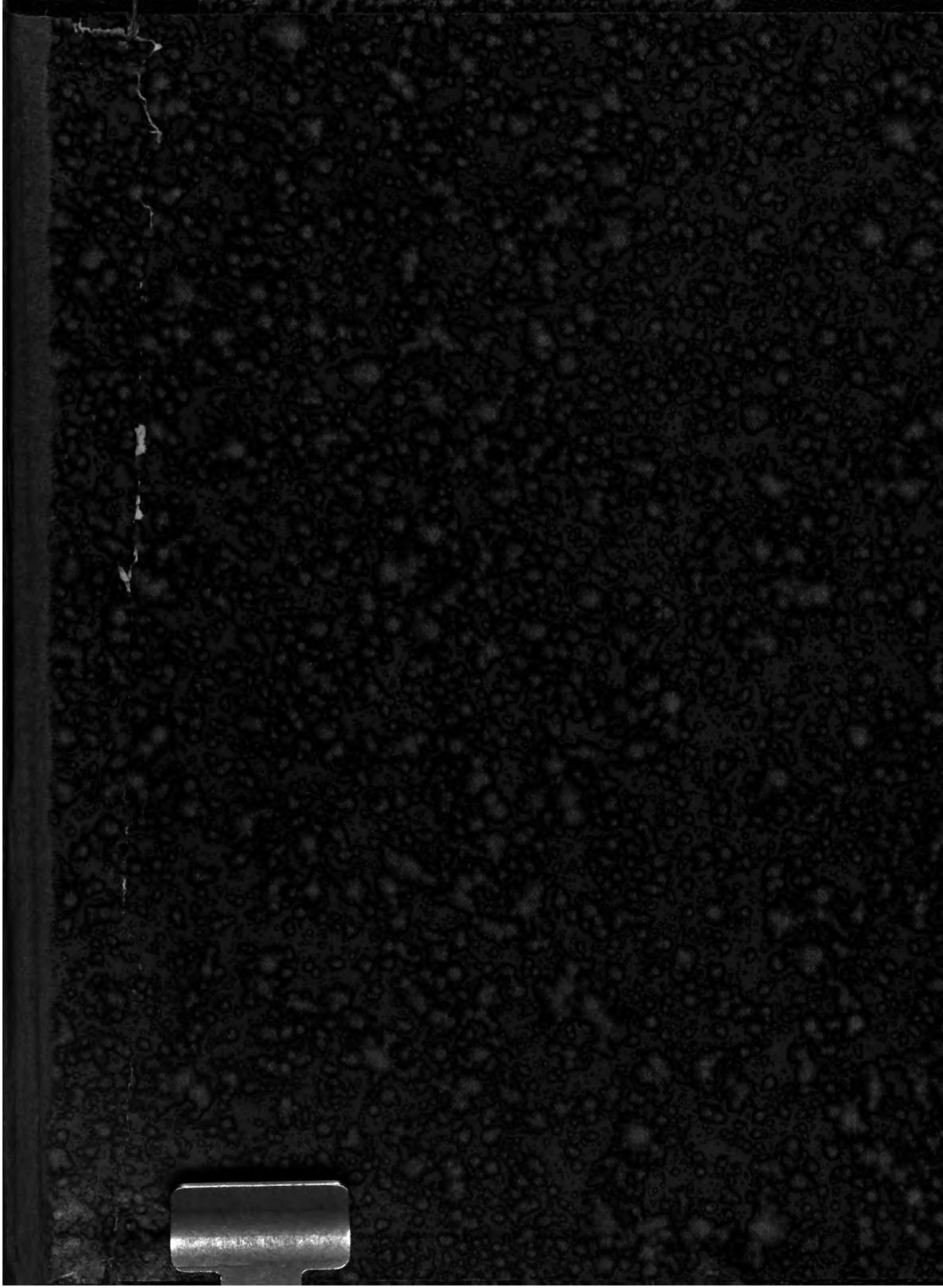
LOCAL DISEASES.

	Admissions.	Deaths.	Total Cases Treated.
Diseases of the—			
Cellular Tissue	639	21	639
Circulatory System—	146	39	146
(*a*) Valvular Disease of Heart	—	—	—
(*b*) Other Diseases	—	—	—
Digestive System—	1,458	236	1,458
(*a*) Diarrhœa	—	—	—
(*b*) Hill Diarrhœa	—	—	—
(*c*) Hepatitis	—	—	—
Congestion of the Liver	—	—	—
(*d*) Abscess of Liver	—	—	—
(*e*) Tropical Liver	—	—	—
(*f*) Jaundice, Catarrhal	—	—	—
(*g*) Cirrhosis of Liver	—	—	—
(*h*) Acute Yellow Atrophy	—	—	—
(*i*) Sprue	—	—	—
(*j*) Other Diseases	—	—	—
Ear	35	—	35
Eye	290	—	290
Generative System—	—	—	—
Male Organs	481	2	481
Female Organs	1,157	44	1,157
Lymphatic System	149	—	149
Nervous System	382	66	382
Nose	9	—	9
Organs of Locomotion	207	1	207
Respiratory System	1,394	455	1,394
Skin—	704	—	704
(*a*) Scabies	—	—	—
(*b*) Ringworm	—	—	—
(*c*) Tinea Imbricata	—	—	—
(*d*) Favus	—	—	—
(*e*) Eczema	—	—	—
(*f*) Other Diseases	—	—	—
Urinary System	602	208	602
Injuries, General, Local—	644	23	644
(*a*) Siriasis (Heatstroke)	—	—	—
(*b*) Sunstroke (Heat Prostration)	—	—	—
(*c*) Other Injuries	—	—	—
Parasites—	473	42	473
Ascaris lumbricoides	—	—	—
Oxyuris vermicularis	—	—	—
Dochmius duodenalis, or Ankylostoma duodenale	—	—	—
Dracunculus medinensis (Guinea-worm)	—	—	—
Tape-worm	—	—	—
Poisons—			
Snake-bites	—	—	—
Corrosive Acids	—	—	—
Metallic Poisons	—	—	—
Vegetable Alkaloids	—	—	—
Nature Unknown	—	—	—
Other Poisons	24	5	24
Surgical Operations—			
Amputations, Major	2,484	12	2,484
,, Minor			
Other Operations	—	—	—
Eye	—	—	—
(*a*) Cataract	—	—	—
(*b*) Iridectomy	—	—	—
(*c*) Other Eye Operations	—	—	—

METEOROLOGICAL RETURN FOR THE YEAR 1905.

	TEMPERATURE						RAINFALL		WIND		R
	Solar Maximum	Minimum on Grass	Shade Maximum	Shade Minimum	Range	Mean	Amount in Inches	Degree of Humidity	General Direction	Average Force	
January..	138·5	72·2	82·1	75·7	6·4	78·9	3·81	74·5	N.E.	2·8	
February	140·0	70·8	82·6	75·5	7·1	79·0	5·34	76·5	,,	3·5	
March	139·0	71·3	83·6	76·0	7·6	79·8	4·83	77·5	,,	3·2	
April	135·5	72·3	84·4	77·3	7·1	80·8	4·07	77	,,	3·4	
May	133·9	71·7	83 6	77·1	6·5	80·4	11·12	82	,,	3·3	
June	135·5	71·6	83·9	76·5	7·4	80·2	10·58	82	,,	2·5	
July	139·5	70·6	83·8	76·6	7·2	80·2	7·84	77·5	,,	3 3	
August	143·4	71·1	85·6	77·2	8·4	81·4	4·25	74	,,	3·5	
September	144·1	71·4	86·4	77·9	8·5	82·2	4·31	73	,,	3·3	
October..	144·1	70·6	86·2	77·6	8·6	81·9	2·14	74	,,	3·7	
November	140·1	72·8	85·7	78·4	7·3	82·0	3·92	76·5	,,	3·3	
December	130·7	72·2	82·9	75·4	7·5	79·1	15·49	82·5	,,	2·7	
Total	1,664·3	858·6	1,010·8	921·2	89·6	965·9	77·70	927	..	38·5	
Mean	138·7	71·5	84·2	76·8	7·5	80·5	6·47	77·2	..	3·2	

[1] Taken in the shade.



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